COLLEGE OF ENGINEERING AND SCIENCE HANDBOOK 2014

DISCLAIMER

The information contained in Victoria University's 2014 College of Engineering and Science was current at 01 November 2013

In today's university environment, changes to courses occur far more frequently than in the past. For current information on Victoria University's courses, readers are advised to access the University's online courses database at www.vu.edu.au/courses

If you have difficulty in accessing this material electronically, please phone (03)9919 6100 for assistance.

IMPORTANT INFORMATION

The course details in this handbook (Plus details of all other Victoria University courses) can also be searched on the University's online courses database at www.vu.edu.au/courses

This handbook can be downloaded as a pdf file from the Victoria University website at www.vu.edu.au/courses/course-handbooks-and-guides

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HOW TO USE THIS HANDBOOK

Victoria University's 2014 College of Engineering and Science Handbook is designed to provide students with detailed information on course structures and unit details for undergraduate and postgraduate courses offered by the college in 2014.

The definition of fields used in course tables throughout this handbook include:

Credit Point – the number of credit points a unit contributes towards the total points needed to complete a course.

PLEASE NOTE

This handbook provides a guide to courses available within Victoria University's College of Engineering and Science in 2014.

Although all attempts have been made to make the information as accurate as possible, students should check with the college that the information is accurate when planning their courses.

NOTE: Prospective students are strongly advised to search the University's online courses database at www.vu.edu.au/courses for the most up-to-date list of courses.

This handbook includes descriptions of courses that may later be altered or include courses that may not be offered due to unforseen circumstances, such as insufficient enrolments or changes in teaching personnel. The fact that details of a course are included in this handbook can in no way be taken as creating an obligation on the part of the University to teach it in any given year or in the manner described. The University reserves the right to discontinue or vary courses at any time without notice.

OTHER INFORMATION

Information about course fees, articulation and credit transfer, recognition of prior learning, admission and enrolment procedures, examinations, and services available to students can be accessed on the University's website or by contacting the University directly.

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UNITS

College of Engineering and Science

Below are details of courses offered by the College of Engineering and Science in 2014.

This information is also available online on the University's searchable courses database at www.vu.edu.au/courses

NOTE: Courses available to international students are marked with the (I) symbol.

ADVANCED DIPLOMA OF BUILDING DESIGN (ARCHITECTURAL)

Course Code:21953VIC
Campus: Industry, Sunshine.

About this course: Open the door to entry level design positions in the building industry. You will learn the following skills:

- construction technology for residential and commercial buildings
- building codes
- designing safe and sustainable buildings
- managing complex projects

Course Objectives: The qualification will be used by Building Design Practitioner aspirants as a job ready entry level outcome.

Careers: The Advanced Diploma of Building Design (Architectural) will provide graduates with the skills and knowledge required for employment as a building designer and to apply for registration in Victoria as a sole practitioner, following the required period of industry experience

Course Duration:2.5 years

Admission Requirements Other: Successful completion of VCE/VCAL or equivalent

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

To be awarded a certificate for the Advanced Diploma of Building Design (Architectural), participants are required to successfully complete all 21 core units.

VPAU582	UNDERTAKE SITE SURVEY AND ANALYSIS TO INFORM DESIGN PROCESS	40
VPAU583	APPLY STRUCTURAL AND CONSTRUCTION TECHNOLOGY TO THE DESIGN OF RESIDENTIAL BUILDINGS	180
VPAU584	APPLY STRUCTURAL AND CONSTRUCTION TECHNOLOGY TO THE DESIGN OF COMMERCIAL BUILDINGS	120
VPAU585	COMPLY WITH CODES AND STANDARDS IN THE DESIGN OF RESIDENTIAL BUILDINGS	40
VPAU586	COMPLY WITH CODES AND STANDARDS IN THE DESIGN OF COMMERCIAL BUILDINGS	50
VPAU587	DESIGN SAFE BUILDINGS	40
VPAU588	DESIGN SUSTAINABLE BUILDINGS	90
VPAU589	INTEGRATE SERVICES LAYOUT INTO DESIGN DOCUMENTATION	40
VPAU590	PRODUCE WORKING DRAWINGS FOR RESIDENTIAL BUILDINGS	180
VPAU591	PRODUCE WORKING DRAWINGS FOR COMMERCIAL BUILDINGS	180
VPAU592	SELECT CONSTRUCTION MATERIALS FOR BUILDING PROJECTS	40
VPAU593	PROVIDE DESIGN SOLUTIONS FOR RESIDENTIAL AND COMMERCIAL BUILDINGS	200
VPAU594	INTEGRATE DIGITAL APPLICATIONS INTO ARCHITECTURAL WORKFLOWS	240
VPAU595	PRESENT ARCHITECTURAL DESIGNS	120
VPAU596	MANAGE ARCHITECTURAL PROJECT ADMINISTRATION	60
VPAU597	UNDERTAKE COMPLEX ARCHITECTURAL PROJECTS	280
VPAU349	WORK SAFELY IN THE CONSTRUCTION INDUSTRY	6
BSBOHS404B	CONTRIBUTE TO THE IMPLEMENTATION OF STRATEGIES TO CONTROL OHS RISK	40
BSBSMB404A	UNDERTAKE SMALL BUSINESS PLANNING	50
VU20716	CONDUCT A BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT	60
VU20717	APPLY BUSHFIRE ATTACK LEVEL (BAL) ASSESSMENT	30

ADVANCED DIPLOMA OF ENGINEERING TECHNOLOGY

Course Code:22228VIC
Campus: Industry, Sunshine.

About this course: Equip yourself for a career in the engineering industries by improving your existing skills in CAD, robotics, and advanced manufacturing. The flexible course structure allows you to add further endorsed or specifically designed units of competency to help meet the industry¿s future needs

Course Objectives: Graduates of the Advanced Diploma of Engineering Technology will be able to:

- recall and apply engineering and scientific principles in designing mechanical, civil and manufacturing engineering applications based on a well founded specialist knowledge domain;

- analyse, diagnose, design and execute judgments with respect to mechanical, civil construction and manufacturing solutions that have a basis in engineering technology;
- propose and brief on technical solutions and concepts typically with options for various engineering environments and contexts;
- integrate and solve interfacing problems between disparate technical or engineering systems;
- manage complex projects on time and within budget;
- and manage autonomously a range of technical objectives within organisations that have outputs based on engineering application.

Careers: People aspiring to senior positions in the public and private sector of the engineering field.

Course Duration:2 years

Admission Requirements Other: Have successfully completed year 11. Or successfully completed a Certificate III in Engineering (from Training Package MEM05) or equivalent; or have a minimum language, literacy and numeracy skills that are equivalent to level 3 of the National Reporting System (NRS).

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

To fulfil the requirements for the qualification learners must complete all the core units listed making up 280 hours and undertake electives making up a minimum of 1,120 hours to provide a course total of 1,400 hours. The choice of electives should be relevant to the student¿s vocational needs and should be made up of: 1. A minimum of 30% of the training effort must be from units first packaged at AQF level 6. 2. The balance of electives may be drawn from Table 3, or other endorsed training packages, provided the units of competency are of an appropriate AQF level and relevant to an engineering job function or to enterprise requirements. Unit Selection will be subject to College approval. On completion of this course, students are also eligible for the Award 22229VIC Diploma of Engineering Technology. Learners exiting prior to meeting all of these requirements will be issued with a Statement of Attainment listing those units of competency that they have successfully completed.

Core Units

Diploma Core Units

MEM13014A	APPLY PRINCIPLES OF WORK OH&S IN WORK ENVIRONMENT	10
MEM30031A	OPERATE COMPUTER-AIDED DESIGN (CAD) SYSTEM TO PRODUCE BASIC DRAWING ELEMENTS	40
MEM18001C	USE HAND TOOLS	20
MEM16006A	ORGANISE AND COMMUNICATE INFORMATION	20
VU20912	PERFORM BASIC MACHINING PROCESSES	40
MEM30007A	SELECT COMMON ENGINEERING MATERIALS	40
MEM30012A	APPLY MATHEMATICAL TECHNIQUES IN A MANUFACTURING, ENGINEERING OR RELATED	40
MSAENV272B	PARTICIPATE IN ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	30

Additional Core Unit for Advanced Diploma

MEM22002A	MANAGE SELF IN THE ENGINEERING ENVIRONMENT	40

Standard General Elecitves

AUMATA5008	PRODUCE DRAWINGS MANUALLY	40
VU21153	PRODUCE BASIC ENGINEERING SKETCHES AND DRAWINGS	20
BSBPMG406A	APPLY COMMUNICATIONS MANAGEMENT TECHNIQUES	40
BSBPMG507A	MANAGE PROJECT COMMUNICATIONS	40
VU21217	IMPLEMENT BASIC MATERIALS SCIENCE PRINCIPLES TO ENGINEERING APPLICATIONS	40
VU21098	APPLY MATHEMATICAL SOLUTIONS TO ENGINEERING PROBLEMS	80
VU21156	USE COMPUTER AIDED DRAFTING SYSTEMS	80
VU21400	APPLY SCIENTIFIC PRINCIPLES TO ENGINEERING PROBLEMS	60
MEM23004A	APPLY TECHNICAL MATHEMATICS	80
VU21100	APPLY PRINCIPLES OF MECHANICS TO ENGINEERING PROBLEMS	60
VU21101	APPLY PRINCIPLES OF STRENGTH OF MATERIALS TO ENGINEERING PROBLEMS	60
VU21157	USE ADVANCED 2D AND 3D COMPUTER AIDED DRAFTING TECHNIQUES	80
VU21103	APPLY CALCULUS TO ENGINEERING PROBLEMS	40
VU21099	APPLY STATISTICAL METHODS FOR QUALITY CONTROL AND RELIABILITY	40
VU21113	APPLY THERMODYNAMIC PRINCIPLES IN ENGINEERING	60
VU21200	APPLY FLUID MECHANIC PRINCIPLES IN MECHANICAL ENGINEERING	80

Civil Engineering Stream

VU21122	PRODUCE AN ADVANCED ENGINEERING DESIGN FOR A REINFORCED CONCRETE STRUCTURE	40
VU21123	PRODUCE AN ADVANCED ENGINEERING DESIGN FOR A STEEL STRUCTURE	60

VU21124	IMPLEMENT SITE INVESTIGATION PROCEDURES	60
VU21125	APPLY CONSTRUCTION PRINCIPLES TO CIVIL ENGINEERING WORKS	60
VU21126	APPLY PRINCIPLES OF MATERIALS TO CIVIL ENGINEERING APPLICATIONS	60
VU21127	APPLY ENVIRONMENTAL SOLUTIONS TO ENGINEERING PROJECTS	40
VU21128	APPLY PRINCIPLES OF MECHANICS TO ENGINEERING STRUCTURES	40
VU21129	APPLY SURVEYING FOR CIVIL ENGINEERING PROJECTS	40
VU21130	PERFORM MEASUREMENTS AND LAYOUT TASKS ON CONSTRUCTION SITES	40
VU21131	PRODUCE AN ENGINEERING DRAINAGE DESIGN OF PIPES AND CULVERTS	60
VU21132	PRODUCE AN ENGINEERING DESIGN FOR A STORMWATER RETICULATION SCHEME	40
VU21133	PRODUCE AN ENGINEERING DESIGN FOR A SEWERAGE RETICULATION SCHEME	40
VU21134	PRODUCE AN ENGINEERING DESIGN FOR A REINFORCED CONCRETE STRUCTURE	40
VU21135	PRODUCE AN ENGINEERING DESIGN FOR A STEEL STRUCTURE	60
VU21136	PRODUCE REINFORCED CONCRETE DRAWINGS	40
VU21137	PRODUCE ADVANCED ENGINEERING DRAWINGS FOR A REINFORCED CONCRETE STRUCTURE	40
VU21138	PRODUCE STRUCTURAL STEEL DRAWINGS	40
VU21139	PRODUCE ADVANCED ENGINEERING DRAWINGS FOR A STEEL STRUCTURE	40
VU21140	PRODUCE STRUCTURAL STEEL SHOP DRAWINGS	40
VU21141	PRODUCE ENGINEERING DRAWINGS FOR A RURAL ROAD	40
VU21142	PRODUCE DRAWINGS TO ENABLE URBAN ROAD CONSTRUCTION	40
VU21143	PRODUCE ENGINEERING DRAWINGS FOR A STORMWATER RETICULATION SCHEME	20
VU21144	APPLY SURVEYING COMPUTATIONS TO CIVIL ENGINEERING PROJECTS	40
VU21145	ANALYSE PIPING DESIGNS	80

Water and Swage Management Stream

VU21244	APPLY PRINCIPLES OF HYDRAULICS TO PIPE AND CHANNEL FLOW	80
VU21245	DESIGN A WATER RETICULATION SCHEME	40
VU21246	PLAN SEWERAGE RETICULATION SYSTEMS	40
VU21247	PLAN WATER RETICULATION SYSTEMS	40
VU21248	DESIGN PRESSURE SEWERAGE SYSTEMS	60
VU21249	DESIGN SEWERAGE PUMPING STATION SYSTEMS	60
VU21250	MANAGE ASSETS IN A WATER UTILITY	60
VU21251	MANAGE DRINKING WATER QUALITY INFORMATION	40
VU21252	MANAGE THE CONSTRUCTION OF PIPELINE SYSTEMS	60

Mechanical Engieering

VU21092	APPLY ADVANCED STATICS PRINCIPLES TO ENGINEERING PROBLEMS	60
VU21093	APPLY ADVANCED DYNAMICS PRINCIPLES TO ENGINEERING PROBLEMS	80
VU21110	PLAN FOR THE IMPLEMENTATION OF MECHANICAL DRIVE SYSTEMS	60
VU21111	PERFORM VIBRATION MEASUREMENT AND CONTROL	60
VU21112	DESIGN MECHANICAL ENGINEERING SYSTEMS	60
VU21114	DESIGN MECHANICAL MACHINES	80
VU21159	APPLY COMPUTER BASED SOLID MODELLING TECHNIQUES	80
VU21203	APPLY HYDRAULIC PRINCIPLES IN ENGINEERING	60
VU21204	APPLY PNEUMATIC PRINCIPLES IN ENGINEERING	60
VU21210	SET UP MANUFACTURING PROCESSES FOR ENGINEERING APPLICATIONS	40
VU21218	IMPLEMENT ADVANCED MATERIALS SCIENCE PRINCIPLES TO ENGINEERING APPLICATIONS	60
VU21219	SET UP MECHATRONICS ENGINEERING SYSTEMS	60
CPCCOHS1001A	WORK SAFELY IN THE CONSTRUCTION INDUSTRY	6
MEM09157A	PERFORM MECHANICAL ENGINEERING DESIGN DRAFTING	80
MEM12024A	PERFORM COMPUTATIONS	30

MEM13013B	WORK SAFELY WITH IONIZING RADIATION	40
MEM16010A	WRITE REPORTS	20
MEM18002B	USE POWER TOOLS/HAND HELD OPERATIONS	20
MEM22001A	PERFORM ENGINEERING ACTIVITIES	60
MEM22015A	SOURCE AND ESTIMATE ENGINEERING MATERIALS REQUIREMENTS	40
MEM22007A	MANAGE ENVIRONMENTAL EFFECTS OF ENGINEERING ACTIVITIES	60
MEM22017A	COORDINATE CONTINUOUS IMPROVEMENT AND TECHNICAL DEVELOPMENT	40
MEM22018A	COORDINATE SALES AND PROMOTION OF ENGINEERING-RELATED PRODUCTS OR SERVICES	60
MEM23003A	OPERATE AND PROGRAM COMPUTERS AND/OR CONTROLLERS IN ENGINEERING SITUATIONS	80
MEM23007A	APPLY CALCULUS TO ENGINEERING TASKS	80
MEM23109A	APPLY ENGINEERING MECHANICS PRINCIPLES	60
MEM23111A	SELECT ELECTRICAL EQUIPMENT AND COMPONENTS FOR ENGINEERING APPLICATIONS	40
VU21094	APPLY FINITE ELEMENT ANALYSIS	60
VU21154	GENERATE DESIGN SOLUTIONS	60
VU21155	IMPLEMENT DESIGN SOLUTIONS	60
VU20909	DEVELOP AN INDIVIDUAL CAREER PLAN FOR THE ENGINEERING INDUSTRY	20
VU20913	APPLY BASIC FABRICATION TECHNIQUES	40
VU21095	APPLY ELECTROTECHNOLOGY PRINCIPLES IN AN ENGINEERING WORK ENVIRONMENT	20
VU21096	USE BASIC ENGINEERING CONCEPTS TO PLAN THE MANUFACTURE OF ENGINEERING COMPONENTS	20
VU20911	HANDLE ENGINEERING MATERIALS	20
VU20903	PRODUCE BASIC ENGINEERING COMPONENTS AND PRODUCTS USING FABRICATION AND MACHINING	60
VU20904	PERFORM CUTTING, GRINDING AND TURNING OPERATIONS	60
VU20914	FORM, BEND AND SHAPE ENGINEERING MATERIALS	60
VU20915	PERFORM BASIC WELDING AND THERMAL CUTTING PROCESSES TO FABRICATE ENGINEERING STRUCTURES	60
VU21158	DESIGN AND PROTOTYPE COMPONENTS AND/OR SMALL STRUCTURES USING ENGINEERING DESIGN PRINCIPLES	60
MEM30031A	OPERATE COMPUTER-AIDED DESIGN (CAD) SYSTEM TO PRODUCE BASIC DRAWING ELEMENTS	40
MEM30033A	USE COMPUTER-AIDED DESIGN (CAD) TO CREATE AND DISPLAY 3-D MODELS	40
VU21160	USE EXTENDED FEATURES OF CAD	40
VU21161	MANAGE CAD SYSTEMS	40
VU21162	MANAGE CAD IN A BUSINESS	80
BSBPMG404A	APPLY QUALITY MANAGEMENT TECHNIQUES.	30
BSBPMG510A	MANAGE PROJECTS	60
MSAPMSUP400A	DEVELOP AND MONITOR QUALITY SYSTEMS	50
MTMPS5603B	DEVELOP, MANAGE AND MAINTAIN QUALITY SYSTEMS	100

DIPLOMA OF ENGINEERING TECHNOLOGY

Course Code:22229VIC
Campus: Industry, Sunshine.

About this course: This leading-edge, current technology focused course provides a non-trades pathway into technician and engineering associate qualifications. It also offers an opportunity for tradespeople to upgrade their qualifications, and for entry into technician positions in industry.

Course Objectives: Graduates of the Diploma of Engineering Technology will be able to:

- implement and utilise engineering solutions in mechanical, civil and manufacturing engineering applications requiring substantial theoretical concepts;
- analyse, diagnose and plan with respect to mechanical, civil construction and manufacturing engineering solutions that have a basis in engineering technology;
- use complex technical information and concepts to plan and implement solutions for a range of engineering environments and contexts;
- troubleshoot interfacing problems between disparate technical or engineering systems;
- provide substantial support in managing complex projects within given time and budgetary constraints, and
- manage prescribed technical objectives within organisations that have outputs based on engineering application.

Careers: Those aspiring to senior positions in the public and private sector of the engineering field.

Course Duration:1 year

Admission Requirements Other: Have successfully completed year 11. Or successfully completed a Certificate III in Engineering (from Training Package MEM05) or equivalent; or have a minimum language, literacy and numeracy skills that are equivalent to level 3 of the National Reporting System (NRS).

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

To fulfil the requirements for the qualification learners must complete all the core units listed making up 240 hours and undertake electives to make up a minimum of 560 hours to provide a course total of 800 hours. The choice of electives should be relevant to the student¿s vocational needs and should be made up of: 1. A minimum of 50% of the training effort must be from units first packaged at an AQF level 5. 2. The balance of units may be drawn from Table 3 or other endorsed training packages, provided the units of competency are of an appropriate AQF level and relevant to an engineering job function or to enterprise requirements. Electuve unit selection is subject to College Approval Learners exiting prior to meeting all of these requirements will be issued with a Statement of Attainment listing those units of competency that they have successfully completed. This qualification can be used as an exit point from 21622VIC Advanced Diploma of Engineering Technology

Core Units

MEM13014A	APPLY PRINCIPLES OF WORK OH&S IN WORK ENVIRONMENT	10
MEM30031A	OPERATE COMPUTER-AIDED DESIGN (CAD) SYSTEM TO PRODUCE BASIC DRAWING ELEMENTS	40
MEM18001C	USE HAND TOOLS	20
MEM16006A	ORGANISE AND COMMUNICATE INFORMATION	20
VU20912	PERFORM BASIC MACHINING PROCESSES	40
MEM30007A	SELECT COMMON ENGINEERING MATERIALS	40
MEM30012A	APPLY MATHEMATICAL TECHNIQUES IN A MANUFACTURING, ENGINEERING OR RELATED	40
MSAENV272B	PARTICIPATE IN ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	30

General Electives

AUMATA5008	PRODUCE DRAWINGS MANUALLY	40
VU21153	PRODUCE BASIC ENGINEERING SKETCHES AND DRAWINGS	20
BSBPMG406A	APPLY COMMUNICATIONS MANAGEMENT TECHNIQUES	40
BSBPMG507A	MANAGE PROJECT COMMUNICATIONS	40
VU21217	IMPLEMENT BASIC MATERIALS SCIENCE PRINCIPLES TO ENGINEERING APPLICATIONS	40
VU21098	APPLY MATHEMATICAL SOLUTIONS TO ENGINEERING PROBLEMS	80
VU21156	USE COMPUTER AIDED DRAFTING SYSTEMS	80
VU21400	APPLY SCIENTIFIC PRINCIPLES TO ENGINEERING PROBLEMS	60
MEM23004A	APPLY TECHNICAL MATHEMATICS	80
VU21100	APPLY PRINCIPLES OF MECHANICS TO ENGINEERING PROBLEMS	60
VU21101	APPLY PRINCIPLES OF STRENGTH OF MATERIALS TO ENGINEERING PROBLEMS	60
VU21157	USE ADVANCED 2D AND 3D COMPUTER AIDED DRAFTING TECHNIQUES	80
VU21103	APPLY CALCULUS TO ENGINEERING PROBLEMS	40
VU21099	APPLY STATISTICAL METHODS FOR QUALITY CONTROL AND RELIABILITY	40
VU21113	APPLY THERMODYNAMIC PRINCIPLES IN ENGINEERING	60
VU21200	APPLY FLUID MECHANIC PRINCIPLES IN MECHANICAL ENGINEERING	80

Civil Engineering

VU21122	PRODUCE AN ADVANCED ENGINEERING DESIGN FOR A REINFORCED CONCRETE STRUCTURE	40
VU21123	PRODUCE AN ADVANCED ENGINEERING DESIGN FOR A STEEL STRUCTURE	60
VU21124	IMPLEMENT SITE INVESTIGATION PROCEDURES	60
VU21125	APPLY CONSTRUCTION PRINCIPLES TO CIVIL ENGINEERING WORKS	60
VU21126	APPLY PRINCIPLES OF MATERIALS TO CIVIL ENGINEERING APPLICATIONS	60
VU21127	APPLY ENVIRONMENTAL SOLUTIONS TO ENGINEERING PROJECTS	40
VU21128	APPLY PRINCIPLES OF MECHANICS TO ENGINEERING STRUCTURES	40
VU21129	APPLY SURVEYING FOR CIVIL ENGINEERING PROJECTS	40
VU21130	PERFORM MEASUREMENTS AND LAYOUT TASKS ON CONSTRUCTION SITES	40
VU21131	PRODUCE AN ENGINEERING DRAINAGE DESIGN OF PIPES AND CULVERTS	60
VU21132	PRODUCE AN ENGINEERING DESIGN FOR A STORMWATER RETICULATION SCHEME	40

VU21133	PRODUCE AN ENGINEERING DESIGN FOR A SEWERAGE RETICULATION SCHEME	40
VU21134	PRODUCE AN ENGINEERING DESIGN FOR A REINFORCED CONCRETE STRUCTURE	40
VU21135	PRODUCE AN ENGINEERING DESIGN FOR A STEEL STRUCTURE	60
VU21136	PRODUCE REINFORCED CONCRETE DRAWINGS	40
VU21137	PRODUCE ADVANCED ENGINEERING DRAWINGS FOR A REINFORCED CONCRETE STRUCTURE	40
VU21138	PRODUCE STRUCTURAL STEEL DRAWINGS	40
VU21139	PRODUCE ADVANCED ENGINEERING DRAWINGS FOR A STEEL STRUCTURE	40
VU21140	PRODUCE STRUCTURAL STEEL SHOP DRAWINGS	40
VU21141	PRODUCE ENGINEERING DRAWINGS FOR A RURAL ROAD	40
VU21142	PRODUCE DRAWINGS TO ENABLE URBAN ROAD CONSTRUCTION	40
VU21143	PRODUCE ENGINEERING DRAWINGS FOR A STORMWATER RETICULATION SCHEME	20
VU21144	APPLY SURVEYING COMPUTATIONS TO CIVIL ENGINEERING PROJECTS	40
VU21145	ANALYSE PIPING DESIGNS	80
Water and Sewage Management Stream		
VU21244	APPLY PRINCIPLES OF HYDRAULICS TO PIPE AND CHANNEL FLOW	80
VU21245	DESIGN A WATER RETICULATION SCHEME	40
VU21246	PLAN SEWERAGE RETICULATION SYSTEMS	40
VU21247	PLAN WATER RETICULATION SYSTEMS	40
VU21248	DESIGN PRESSURE SEWERAGE SYSTEMS	60
VU21249	DESIGN SEWERAGE PUMPING STATION SYSTEMS	60
VU21250	MANAGE ASSETS IN A WATER UTILITY	60
VU21251	MANAGE DRINKING WATER QUALITY INFORMATION	40
VU21252	MANAGE THE CONSTRUCTION OF PIPELINE SYSTEMS	60
Mechanical Engineering		
VU21159	APPLY COMPUTER BASED SOLID MODELLING TECHNIQUES	80

VU21110	PLAN FOR THE IMPLEMENTATION OF MECHANICAL DRIVE SYSTEMS	60
VU21111	PERFORM VIBRATION MEASUREMENT AND CONTROL	60
VU21112	DESIGN MECHANICAL ENGINEERING SYSTEMS	60
VU21092	APPLY ADVANCED STATICS PRINCIPLES TO ENGINEERING PROBLEMS	60
VU21093	APPLY ADVANCED DYNAMICS PRINCIPLES TO ENGINEERING PROBLEMS	80
VU21114	DESIGN MECHANICAL MACHINES	80
VU21203	APPLY HYDRAULIC PRINCIPLES IN ENGINEERING	60
VU21204	APPLY PNEUMATIC PRINCIPLES IN ENGINEERING	60
VU21210	SET UP MANUFACTURING PROCESSES FOR ENGINEERING APPLICATIONS	40
VU21218	IMPLEMENT ADVANCED MATERIALS SCIENCE PRINCIPLES TO ENGINEERING APPLICATIONS	60
VU21219	SET UP MECHATRONICS ENGINEERING SYSTEMS	60
Additional Elective Options		
CPCCOHS1001A	WORK SAFELY IN THE CONSTRUCTION INDUSTRY	6
MEM09157A	PERFORM MECHANICAL ENGINEERING DESIGN DRAFTING	80
MEM12024A	PERFORM COMPUTATIONS	30
MEM13013B	WORK SAFELY WITH IONIZING RADIATION	40
MEM16010A	WRITE REPORTS	20
MEM18002B	USE POWER TOOLS/HAND HELD OPERATIONS	20
MEM22001A	PERFORM ENGINEERING ACTIVITIES	60
MEM22015A	SOURCE AND ESTIMATE ENGINEERING MATERIALS REQUIREMENTS	40
MEM22007A	MANAGE ENVIRONMENTAL EFFECTS OF ENGINEERING ACTIVITIES	60
MEM22017A	COORDINATE CONTINUOUS IMPROVEMENT AND TECHNICAL DEVELOPMENT	40
MEM22018A	COORDINATE SALES AND PROMOTION OF ENGINEERING-RELATED PRODUCTS OR SERVICES	60
MEM23003A	OPERATE AND PROGRAM COMPUTERS AND/OR CONTROLLERS IN ENGINEERING SITUATIONS	80
MEM23007A	APPLY CALCULUS TO ENGINEERING TASKS	80

MEM23109A	APPLY ENGINEERING MECHANICS PRINCIPLES	60
MEM23111A	SELECT ELECTRICAL EQUIPMENT AND COMPONENTS FOR ENGINEERING APPLICATIONS	40
VU21094	APPLY FINITE ELEMENT ANALYSIS	60
VU21154	GENERATE DESIGN SOLUTIONS	60
VU21155	IMPLEMENT DESIGN SOLUTIONS	60
VU20909	DEVELOP AN INDIVIDUAL CAREER PLAN FOR THE ENGINEERING INDUSTRY	20
VU20913	APPLY BASIC FABRICATION TECHNIQUES	40
VU21095	APPLY ELECTROTECHNOLOGY PRINCIPLES IN AN ENGINEERING WORK ENVIRONMENT	20
VU21096	USE BASIC ENGINEERING CONCEPTS TO PLAN THE MANUFACTURE OF ENGINEERING COMPONENTS	20
VU20911	HANDLE ENGINEERING MATERIALS	20
VU20903	PRODUCE BASIC ENGINEERING COMPONENTS AND PRODUCTS USING FABRICATION AND MACHINING	60
VU20904	PERFORM CUTTING, GRINDING AND TURNING OPERATIONS	60
VU20914	FORM, BEND AND SHAPE ENGINEERING MATERIALS	60
VU20915	PERFORM BASIC WELDING AND THERMAL CUTTING PROCESSES TO FABRICATE ENGINEERING STRUCTURES	60
VU21158	DESIGN AND PROTOTYPE COMPONENTS AND/OR SMALL STRUCTURES USING ENGINEERING DESIGN PRINCIPLES	60
MEM30031A	OPERATE COMPUTER-AIDED DESIGN (CAD) SYSTEM TO PRODUCE BASIC DRAWING ELEMENTS	40
MEM30033A	USE COMPUTER-AIDED DESIGN (CAD) TO CREATE AND DISPLAY 3-D MODELS	40
VU21160	USE EXTENDED FEATURES OF CAD	40
VU21161	MANAGE CAD SYSTEMS	40
VU21162	MANAGE CAD IN A BUSINESS	80
BSBPMG404A	APPLY QUALITY MANAGEMENT TECHNIQUES.	30
BSBPMG510A	MANAGE PROJECTS	60
MSAPMSUP400A	DEVELOP AND MONITOR QUALITY SYSTEMS	50
MTMPS5603B	DEVELOP, MANAGE AND MAINTAIN QUALITY SYSTEMS	100

DIPLOMA OF BUILDING SURVEYING

Course Code:CPC50108
Campus: Sunshine.

About this course: Develop the specialist skills for a future as a building surveyor or building certifier. This course provides training in building theory and surveying related to residential, industrial and commercial buildings. You will learn:

- plan preparation
- estimating scheduling
- construction technology occupational health and safety
- site supervision
- surveying
- cost control
- business management
- development control
- surveying procedures and practices

Course Objectives: The course provides training in building theory and surveying related to residential, industrial and commercial buildings. Graduates will have developed specialist skills and knowledge in plan preparation, estimating scheduling, construction technology OH&S, site supervision, surveying, cost control, business management, development control, surveying procedures and practices.

- Building surveyor
- Building certifier.

Careers:

Course Duration:1 year

Admission Requirements Other: Successful completion of VCE/VCAL or equivalent

Selection Processes: Direct Entry, Interview, Written Test, VTAC

COURSE STRUCTURE

24 compulsory units of competency are required for award of this qualification.

Compulsory Units of Study

BSBADM506B	MANAGE BUSINESS DOCUMENT DESIGN AND DEVELOPMENT	80
BSBITS401B	MAINTAIN BUSINESS TECHNOLOGY	40
CHCCOM403A	USE TARGETED COMMUNICATION SKILLS TO BUILD RELATIONSHIPS	55
CHCCOM504A	DEVELOP, IMPLEMENT AND PROMOTE EFFECTIVE WORKPLACE COMMUNICATION	80
CPCCSV5001A	ASSESS THE CONSTRUCTION OF DOMESTIC SCALE BUILDINGS	100
CPCCSV5002A	EVALUATE MATERIALS FOR CONSTRUCTION OF DOMESTIC SCALE BUILDINGS	72

CPCCSV5003A	PRODUCE WORKING DRAWINGS FOR RESIDENTIAL BUILDINGS	90
CPCCSV5004A	APPLY LEGISLATION TO URBAN DEVELOPMENT AND BUILDING CONTROLS	36
CPCCSV5005A	APPLY FOOTING AND GEOMECHANICAL DESIGN PRINCIPLES TO DOMESTIC SCALE BUILDINGS	36
CPCCSV5006A	ASSESS CONSTRUCTION FAULTS IN RESIDENTIAL BUILDINGS	36
CPCCSV5007A	UNDERTAKE SITE SURVEYS AND SET-OUT PROCEDURES FOR BUILDING PROJECTS	72
CPCCSV5008A	APPLY BUILDING CONTROL LEGISLATION TO BUILDING SURVEYING	36
CPCCSV5009A	ASSESS THE IMPACT OF FIRE ON BUILDING MATERIALS	36
CPCCSV5010A	INTERACT WITH CLIENTS IN A REGULATED ENVIRONMENT	36
CPCCSV5011A	APPLY BUILDING CODES AND STANDARDS TO RESIDENTIAL BUILDINGS	36
CPCCSV5012A	ASSESS TIMBER-FRAMED DESIGNS FOR ONE AND TWO STOREY BUILDINGS	36
CPCCSV5013A	APPLY PRINCIPLES OF ENERGY EFFICIENT DESIGN TO BUILDINGS	36
CPCCSV5014A	APPLY BUILDING SURVEYING PROCEDURES TO RESIDENTIAL BUILDINGS	36
CPCCSV5015A	ASSESS STRUCTURAL REQUIREMENTS FOR DOMESTIC SCALE BUILDINGS	72
ICAICT102A	OPERATE WORD-PROCESSING APPLICATIONS	30
ICAICT103A	USE, COMMUNICATE AND SEARCH SECURELY ON THE INTERNET	50
ICAICT105A	OPERATE SPREADSHEET APPLICATIONS	30
ICAICT201A	USE COMPUTER OPERATING SYSTEMS AND HARDWARE	60
ICAICT210A	OPERATE DATABASE APPLICATIONS	40

DIPLOMA OF BUILDING AND CONSTRUCTION (BUILDING)

Course Code:CPC50210
Campus: Sunshine.

About this course: Get the skills you need to work effectively as a builder You will learn essential skills from our industry professionals. You will learn how to

- apply building codes and standards
- select and prepare a construction contracts
- identify and produce estimated costs for building projects
- prepare and evaluate tender documentation
- monitor costing systems on building and construction projects
- supervise the planning of on-site medium rise building or construction work
- manage construction work
- apply structural principles to the construction of medium rise buildings
- apply principles of OHS risk management
- manage project quality
- manage project risk

This qualification will help you to meet the licensing and registration requirements to become registered builders.

Course Objectives: This qualification is designed to meet the needs of builders, including selecting contractors, overseeing the work and its quality, and liaising with clients. This qualification is designed to assist in meeting the licensing/registration requirements of those wishing to become a registered builder.

Careers: Occupational titles may include:

- Builder
- Estimator
- Building Supervisor

Course Duration:2 years

Admission Requirements Other: Successful completion of VCE/VCAL or equivalent.

Selection Processes: Direct Entry, Interview, VTAC

COURSE STRUCTURE

18 units of competency are required for award of this qualification: 13 compulsory units 5 elective units.

Core Units of Study

CPCCBC4001A	APPLY BUILDING CODES AND STANDARDS TO THE CONSTRUCTION PROCESS FOR LOW RISE BUILDING PROJECTS	40
CPCCBC4003A	SELECT AND PREPARE A CONSTRUCTION CONTRACT	40
CPCCBC4004A	IDENTIFY AND PRODUCE ESTIMATED COSTS FOR BUILDING AND CONSTRUCTION PROJECTS	60
CPCCBC4010B	APPLY STRUCTURAL PRINCIPLES TO RESIDENTIAL LOW RISE CONSTRUCTIONS	160
CPCCBC4013A	PREPARE AND EVALUATE TENDER DOCUMENTATION	20
CPCCBC5001B	APPLY BUILDING CODES AND STANDARDS TO THE CONSTRUCTION PROCESS FOR MEDIUM RISE BUILDING PROJECTS	200
CPCCBC5002A	MONITOR COSTING SYSTEMS ON MEDIUM RISE BUILDING AND CONSTRUCTION PROJECTS	60

CPCCBC5003A	SUPERVISE THE PLANNING OF ON-SITE MEDIUM RISE BUILDING OR CONSTRUCTION WORK	200
CPCCBC5010B	MANAGE CONSTRUCTION WORK	150
CPCCBC5018A	APPLY STRUCTURAL PRINCIPLES TO THE CONSTRUCTION OF MEDIUM RISE BUILDINGS	300
BSBOHS504B	APPLY PRINCIPLES OF OHS RISK MANAGEMENT	40
BSBPMG505A	MANAGE PROJECT QUALITY	40
BSBPMG508A	MANAGE PROJECT RISK	40

Elective Units of Study

CPCCBC5006B	APPLY SITE SURVEYS AND SET-OUT PROCEDURES TO MEDIUM RISE BUILDING PROJECTS	110
CPCCBC5011A	MANAGE ENVIRONMENTAL MANAGEMENT PRACTICES AND PROCESSES IN BUILDING AND CONSTRUCTION	150
BSBWOR501B	MANAGE PERSONAL WORK PRIORITIES AND PROFESSIONAL DEVELOPMENT	60
CPCCBC4012A	READ AND INTERPRET PLANS AND SPECIFICATIONS	30
CPCCSV6005A	EVALUATE SERVICES LAYOUT AND CONNECTION METHODS FOR RESIDENTIAL AND COMMERCIAL BUILDINGS UP TO THREE STOREYS	40
CPCCBC5007A	ADMINISTER THE LEGAL OBLIGATIONS OF A BUILDING OR CONSTRUCTION CONTRACT	100

ADVANCED DIPLOMA OF BUILDING SURVEYING

Course Code:CPC60108
Campus: Sunshine.

About this course: This course provides training in building theory and surveying related to residential, industrial and commercial buildings. You will learn specialist skills in:

- plan preparation
- estimating scheduling
- construction technology
- site supervision
- surveying
- cost control
- business management
- development control
- surveying procedures and practices

Course Objectives: The course provides training in building theory and surveying related to residential, industrial and commercial buildings. Graduates will have developed specialist skills and knowledge in plan preparation, estimating scheduling, construction technology OH&S, site supervision, surveying, cost control, business management, development control, surveying procedures and practices.

- Building surveyor
- Building certifier.

Careers:

Course Duration:1 year

Admission Requirements Other: Successful completion of the Diploma in Building Surveying or equivalent.

Selection Processes: Direct Entry, Interview, Written Test

COURSE STRUCTURE

43 units of competency are required for award of this qualification.

Compulsory Units of Study

CPCCSV5001A	ASSESS THE CONSTRUCTION OF DOMESTIC SCALE BUILDINGS	100
CPCCSV5002A	EVALUATE MATERIALS FOR CONSTRUCTION OF DOMESTIC SCALE BUILDINGS	72
CPCCSV5003A	PRODUCE WORKING DRAWINGS FOR RESIDENTIAL BUILDINGS	90
CPCCSV5004A	APPLY LEGISLATION TO URBAN DEVELOPMENT AND BUILDING CONTROLS	36
CPCCSV5005A	APPLY FOOTING AND GEOMECHANICAL DESIGN PRINCIPLES TO DOMESTIC SCALE BUILDINGS	36
CPCCSV5006A	ASSESS CONSTRUCTION FAULTS IN RESIDENTIAL BUILDINGS	36
CPCCSV5007A	UNDERTAKE SITE SURVEYS AND SET-OUT PROCEDURES FOR BUILDING PROJECTS	72
CPCCSV5008A	APPLY BUILDING CONTROL LEGISLATION TO BUILDING SURVEYING	36
CPCCSV5009A	ASSESS THE IMPACT OF FIRE ON BUILDING MATERIALS	36
CPCCSV5010A	INTERACT WITH CLIENTS IN A REGULATED ENVIRONMENT	36
CPCCSV5011A	APPLY BUILDING CODES AND STANDARDS TO RESIDENTIAL BUILDINGS	36
CPCCSV5012A	ASSESS TIMBER-FRAMED DESIGNS FOR ONE AND TWO STOREY BUILDINGS	36
CPCCSV5013A	APPLY PRINCIPLES OF ENERGY EFFICIENT DESIGN TO BUILDINGS	36
CPCCSV5014A	APPLY BUILDING SURVEYING PROCEDURES TO RESIDENTIAL BUILDINGS	36
CPCCSV5015A	ASSESS STRUCTURAL REQUIREMENTS FOR DOMESTIC	72

	SCALE BUILDINGS	
CPCCSV6001A	ASSESS THE CONSTRUCTION OF BUILDINGS UP TO THREE STOREYS	72
CPCCSV6002A	PRODUCE WORKING DRAWINGS FOR BUILDINGS UP TO THREE STOREYS	40
CPCCSV6003A	ASSESS CONSTRUCTION FAULTS IN BUILDINGS UP TO THREE STOREYS	40
CPCCSV6004A	APPLY FOOTING AND GEOMECHANICAL DESIGN PRINCIPLES TO BUILDINGS UP TO THREE STOREYS	40
CPCCSV6005A	EVALUATE SERVICES LAYOUT AND CONNECTION METHODS FOR RESIDENTIAL AND COMMERCIAL BUILDINGS UP TO THREE STOREYS	40
CPCCSV6006A	EVALUATE THE USE OF CONCRETE FOR RESIDENTIAL AND COMMERCIAL BUILDINGS UP TO THREE STOREYS	40
CPCCSV6007A	ASSESS STRUCTURAL REQUIREMENTS FOR BUILDINGS UP TO THREE STOREYS	40
CPCCSV6008A	APPLY BUILDING CODES AND STANDARDS TO BUILDINGS UP TO THREE STOREYS	72
CPCCSV6009A	IMPLEMENT PERFORMANCE-BASED CODES AND RISK MANAGEMENT PRINCIPLES FOR BUILDINGS UP TO THREE STOREYS	72
CPCCSV6010A	APPLY FIRE TECHNOLOGY TO BUILDINGS UP TO THREE STOREYS	40
CPCCSV6011A	APPLY LEGAL PROCEDURES TO BUILDING SURVEYING	40
CPCCSV6012A	FACILITATE COMMUNITY DEVELOPMENT CONSULTATION	40
CPCCSV6013A	COORDINATE BUILDING REFURBISHMENT	72
CPCCSV6014A	MANAGE AND PLAN LAND USE	40
CPCCSV6015A	ANALYSE AND PRESENT BUILDING SURVEYING RESEARCH INFORMATION	90
CPCCSV6016A	APPLY BUILDING SURVEYING PROCEDURES TO BUILDINGS UP TO THREE STOREYS	90
BSBADM506A	MANAGE BUSINESS DOCUMENT DESIGN AND DEVELOPMENT	80
BSBITS401A	MAINTAIN BUSINESS TECHNOLOGY	40
BSBMGT502B	MANAGE PEOPLE PERFORMANCE	70
CHCCOM403A	USE TARGETED COMMUNICATION SKILLS TO BUILD RELATIONSHIPS	55
CHCCOM4B	DEVELOP, IMPLEMENT AND PROMOTE EFFECTIVE COMMUNICATIONS TECHNIQUES	75
ICAU1128B	OPERATE A PERSONAL COMPUTER	30
ICAU1129B	OPERATE A WORD PROCESSING APPLICATION	30
ICAU1130B	OPERATE A SPREADSHEET APPLICATION	30
ICAU1131B	OPERATE A DATABASE APPLICATION	40
ICAU1132B	OPERATE A PRESENTATION PACKAGE	25
LGAPLEM502A	APPLY ECOLOGICALLY SUSTAINABLE DEVELOPMENT PRINCIPLES TO THE BUILT ENVIRONMENT	60
LMFFT4010A	IDENTIFY AND CALCULATE PRODUCTION COSTS	36

BACHELOR OF ENGINEERING (ARCHITECTURAL ENGINEERING)

Course Code:EBAE
Campus: Footscray Park.
This course is for Continuing students only.

About this course: This program is unique in Australia. Students specialise in the planning, design and construction of building environmental control, life safety or building structural systems. These systems make buildings safe places in which to live and work. The program focuses on sustainable design concepts.

Course Objectives: The course is designed to develop vocational skills for the engineering planning, design, construction, maintenance and management of building environmental and life safety systems. The basic objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge capped by specific theoretical and practical exposure to the design of building environmental and life safety systems;
- have the ability to communicate effectively, both orally and in writing, and work well in a team situation;
- have an understanding of community need for building infrastructure in the context of societal aspirations and expectations;
- are motivated to continually improve their knowledge base; and
- are immediately productive upon completion of the course and are thus attractive to prospective employers.

The first two years of the degree program involves engineering fundamentals to provide a solid foundation for the applied engineering subjects in the following years of the course. Studies in architecture design practices and architectural history are developed in second and third year. These fundamentals provide students with the basis of understanding all developments in the profession of Architectural Engineering and Engineering in general as technology continually changes and the profession undergoes continual adjustment. The applied engineering subjects building structures, building environmental and life safety systems, and building project management are introduced. In the final two years of the program, students undertake a major in either environmental systems design or structural systems design. An optional integrated 12 weeks industry placement period is available in Architectural Engineering at the end of the third year of the course in a 'summer semester' subject. Architectural Engineering graduates will have enhanced skills for careers in:

- advanced environmental services system design;
- building renovation and refurbishment;
- building structures design;
- computer aided design and drawing;
- construction planning, management and project supervision;
- cost estimating and project feasibility;
- building energy audits and conservation studies;
- engineering consultation and investigations;
- facilities management and programming;
- interior lighting design;
- risk assessment for building system performance;
- support for preservation Architecture; and
- simulation of building environmental system performance.

Careers: Building or engineering companies in close co-operation with architects, engineers and other building professionals in the planning, design and construction of environmental or structural building systems; building facilities management.

Course Duration:4 years

Admission Requirements Year 12:VCE with a score of at least 22 in English and Mathematical Methods or Specialist Mathematics Units 3 and 4. Articulation from Associate Diploma or Diploma courses in Building Construction and Design or Engineering. Credit will be given to subjects passed to a sufficient level of competence. Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner. Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS - an overall band score of 6+, subject to individual profile; or TOEFL - a score of 550+, and a Test of Written English score of 5+.

COURSE STRUCTURE

The course is offered over four years on a full-time basis of 22 contact hours per week. Part-time study may be approved. The course however cannot be completed solely on a part-time basis.

Engineering subject codes commence with 'V'. Science subject codes commence with 'R'.

Year 1

Semester One

REP1001	ENGINEERING PHYSICS 1A	12
RMA1001	ENGINEERING MATHEMATICS 1A	12
VAN1011	EXPERIMENTATION AND COMPUTING	12
VAN1051	ENGINEERING PROFESSION	12

Semester Two

REP1003	ENGINEERING PHYSICS 1C	12
RMA1002	ENGINEERING MATHEMATICS 1B	12
VAN1022	SOLID MECHANICS 1	12
VAN1032	INTRODUCTION TO DESIGN	12

Year 2

Semester One

VAA2031	ARCHITECTURAL HISTORY & DESIGN	12
VAN2021	SOLID MECHANICS 2	12
VAN2041	THERMOFLUIDS	12
VAN2061	ENGINEERING MATERIALS	12

Semester Two

VAA2002	ELECTRICAL POWER SYSTEMS 1	12
VAC2022	BUILDING MATERIALS AND CONSTRUCTION	12
VAC2042	HYDRAULICS	12
VAN2032	ENGINEERING DESIGN	12

SERVICES STREAM

Year 3

Semester One

VAA3001	ELECTRICAL POWER SYSTEMS 2	12
VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAA3071	HVAC SYSTEMS 1	12
VAA3081	BUILDING CONSTRUCTION AND LEGISLATION 1	12

Semester Two

VAN3052	ENGINEERING MANAGEMENT	12
VAA3032	ENVIRONMENTALLY SUSTAINABLE DESIGN 2	12
VAA3042	HYDRAULIC SERVICES SYSTEMS	12
VAA3072	HVAC SYSTEMS 2	12

STRUCTURES STREAM

Year 3

Semester One

VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAA3081	BUILDING CONSTRUCTION AND LEGISLATION 1	12

VAC3021	STRUCTURAL ANALYSIS	12
VAC3061	GEOMECHANICS	12

Semester Two

VAA3042	HYDRAULIC SERVICES SYSTEMS	12
VAC3062	GEOTECHNICAL ENGINEERING	12
VAC3092	STRUCTURAL DESIGN	12
VAN3052	ENGINEERING MANAGEMENT	12

SERVICES STREAM

Year 4

Semester One

VAA4001	ARCHITECTURAL LIGHTING AND COMMUNICATIONS SYSTEMS	12
VAA4051	BUILDING QUANTITIES AND COSTS	6
VAA4071	HVAC SYSTEMS 3	6
VAN4011	ENGINEERING PROJECT 1	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12

Semester Two

VAA4032	ENVIRONMENTALLY SUSTAINABLE DESIGN 3	12
VAA4042	BUILDING FIRE SAFETY SYSTEMS	12
VAA4082	BUILDING CONSTRUCTION AND LEGISLATION 2	6
VAA4092	BUILDING SYSTEMS DESIGN AND CONSTRUCTION	6
VAN4012	ENGINEERING PROJECT 2	12

STRUCTURES STREAM

Year 4

Semester One

VAA4051	BUILDING QUANTITIES AND COSTS	6
VAC4021	STRUCTURAL ENGINEERING ANALYSIS AND DESIGN 1	12
VAN4011	ENGINEERING PROJECT 1	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
VAA4091	STRUCTURAL DYNAMICS 1	6

Semester Two

VAA4042	BUILDING FIRE SAFETY SYSTEMS	12
VAA4082	BUILDING CONSTRUCTION AND LEGISLATION 2	6
VAA4092	BUILDING SYSTEMS DESIGN AND CONSTRUCTION	6
VAC4022	STRUCTURAL ENGINEERING ANALYSIS AND DESIGN 2	12
VAN4012	ENGINEERING PROJECT 2	12

Other Course Specific Notes

Assessment in subjects is designed to monitor a student's progress and achievements as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Discipline Leader in exceptional circumstances.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Degree with Honours

A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy, if they have achieved a minimum hour weighted average of 60 per cent over year levels 1 to 3, have not repeated a subject throughout levels 1 to 3 and have not been granted more than one year completion by compensation throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

Industrial Experience

Students are required to undertake a 12 week industrial work experience period during their course. At the end of third year, students will have to undertake a 12 week (minimum) integrated industry placement program. It is intended that this program will meet the 12 week industrial work experience requirements imposed upon all accredited Engineering degree courses by Engineers Australia.

Professional Recognition

The Bachelor of Engineering in Architectural Engineering will be submitted for recognition by the Building Practitioners Board and Building Control Commission in Victoria. This submission is to meet the minimum academic qualification for registration as a Mechanical or Electrical Engineer, or as a Civil Engineer (Structures) as defined by the responsibilities of these categories of 'Engineer' in the Victorian

Building Control Act. The degree satisfies the requirements for accreditation by The Institution of Engineers, Australia and will be submitted for accreditation by the Australian Institute of Building.

Overseas Exchange Program

Each year two students from Victoria University who are enrolled in either Architectural or Building Engineering, are able to undertake studies with full credit for one semester in the third year of the Architectural Engineering degree program at the University of Nebraska - Omaha (UNO), U.S.A.

University scholarships are available to assist students in undertaking this exchange. The program at UNO is one of the newest and best resourced Architectural Engineering degrees in the U.S.A., having commenced in 1999 within new propose built buildings and facilities.

Admission Requirements

The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows:

BACHELOR OF ENGINEERING/BACHELOR OF LAWS

Course Code:EBBL
Campus: Footscray Park.
This course is for Continuing students only.

Course Objectives: The course will provide students with a broad ranging program of study and learning aimed at satisfying the academic and professional requirements in both law and the appropriate field of engineering. The course will equip graduates to obtain employment in law, business and government, in major engineering organisations, at the Bar and elsewhere. It will improve learning by providing a fundamental framework for the application of legal and engineering concepts and ideas and their co-integration, which will ensure the students, are capable of engaging successfully in these professional areas in a commercial environment.

Course Duration:6 years

Admission Requirements Year 12: To qualify for admission to the course an applicant must have successfully completed a course of study at year 12 level or equivalent. In addition to satisfying the entry requirements for Australian resident students or demonstrating equivalence, overseas students must provide evidence of proficiency in the English language: International English Language Testing System - overall score of 6 and no individual band score less than 6.0.

COURSE STRUCTURE

The course is offered over six years on a full-time basis, or part-time equivalent. Each student must obtain 576 credit points through academic study to graduate. Subject to Grade Point Average (GPA), students undertaking the Bachelor of Laws and Bachelor of Laws combined degrees may receive their award with honours. In calculating a specified grade of honours, the following points shall be attributed to Bachelor of Laws units - Pass = 5 points; Credit = 6 points; Distinction = 7 points; High Distinction = 8 points. In calculating the GPA, those Bachelor of Laws units successfully completed by the student will be ranked in order commencing with 8 point units and ending with 5 point units (if applicable). The aggregate of points attributed to the first two thirds of units so listed shall then be calculated and a grade point average determined (aggregated so calculated by the number of units being the first two thirds of units in the list). Bachelor of Laws with 2B Honours - GPA of 7 or more and a Credit grade in the unit of study Advanced Legal Research Dissertation; Bachelor of Laws with 2A Honours - GPA of 7 or more and a Distinction grade in the unit of study Advanced Legal Research Dissertation; Bachelor of Laws with 1st Class Honours - GPA of 7.5 or more and a Distinction or better grade in the unit of study Advanced Legal Research Dissertation. Other Course Specific Notes Engineering Component: 288 credit points taken from an engineering specialisation, with at least 48 Credit points in units of study normally taken in the 3rd year of a BEng degree and at least 48 credit points in units of study normally taken in the 4th year of a BSc degree. Students will generally take a selection of the units of study from one of the BEng courses offered by the College of Engineering and Science as advised by the course coordinator.

- Compulsory Law Units of Study

BLB2122	ADVOCACY AND COMMUNICATION	12
BLB1113	AUSTRALIAN ADMINISTRATIVE LAW	12
BLB1101	AUSTRALIAN LEGAL SYSTEM IN CONTEXT	12
BLB1118	CONSTITUTIONAL LAW	12
BLB1102	CONTRACTS 1	12
BLB1117	CONTRACTS 2	12
BLB2119	CORPORATIONS LAW 1	12
BLB2124	CORPORATIONS LAW 2	12
BLB3128	CRIMINAL LAW	12
BLB3127	DISPUTE RESOLUTION AND CIVIL PROCEDURE	12
BLB4136	EQUITY AND TRUSTS	12
BLB4139	EVIDENCE	12
BLB2126	FEDERAL CONSTITUTIONAL LAW	12
BLB3130	INTERVIEWING AND NEGOTIATION SKILLS	12
BLB3131	LAWYERS AND LEGAL ETHICS	12
BLB1114	LEGAL RESEARCH METHODS	12
BLB2121	LEGAL THEORY	12
BLB2120	LEGAL WRITING AND DRAFTING	12
BLB2125	REAL PROPERTY LAW	12
BLB1115	TORTS	12

Law Electives - Select four of the following:

BLB4144	EUROPEAN UNION LAW	12

BLB3136	FAMILY LAW IN SOCIETY	12
BLB4145	HUMAN RIGHTS LAW	12
BLB3129	INTELLECTUAL PROPERTY LAW	12
BLB4141	INTERNATIONAL TRADE LAW	12
BLB4140	PRIVACY AND MEDIA LAW	12
BBB3200	PROFESSIONAL LEGAL PRACTICE	12
BLB4143	PUBLIC INTERNATIONAL LAW	12
BLB3132	SECURITIES LAW	12
BLB3134	TAXATION LAW	12
BLB1125	TORTS 2	12
BLB2123	TRADE PRACTICES LAW AND POLICY	12
BLB4146	WILLS AND THE ADMINISTRATION OF ESTATES	12
BLB4142	ADVANCED LEGAL RESEARCH DISSERTATION	12
BLB4137	ASIAN LEGAL SYSTEMS	12
BLB4135	AUSTRALIAN EMPLOYMENT LAW	12
BLB3133	COMPARATIVE COMMERCIAL LAW	12
BLB4138	CONFLICT OF LAWS	12
BLB3138	CRIMINAL LAW 2	12

BACHELOR OF ENGINEERING (BUILDING ENGINEERING)

Course Code:EBCB
Campus: Footscray Park.
This course is for Continuing students only.

About this course: This course is unique in Victoria. Building engineers plan and manage the construction of buildings. They must understand the environmental services and structural systems of buildings. This multidisciplinary program focuses on building feasibility, construction planning and project management. Sustainable design concepts are introduced with an appreciation of architectural design.

Course Objectives: The course is designed to develop vocational skills for the engineering planning, design, construction, maintenance and management of buildings and building services systems. The basic objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge capped by specific theoretical and practical exposure to either the design of building structures or building services systems;
- have the ability to communicate effectively, both orally in writing, and work well in a team situation;
- have an understanding of community need for building infrastructure in the context of societal aspirations and expectations
- are motivated to continually improve their knowledge base; and
- are immediately productive upon completion of the course and are thus attractive to prospective employers.

The course recognises societal needs for professional Engineers who have sound technical knowledge and good communication skills and capable of providing appropriate building infrastructure that is affordable, safe and comfortable to live and work within. The course is founded on a broad base of science and engineering fundamentals in the first and second year, with emphasis then given in the third and fourth years to applied discipline-specific topics, design and project work. The three study areas commence in the second and third years of the course and are building structures, building services and building construction and project management. In the final year, the focus for the course becomes planning and project management of the building construction process. Strong emphasis is given to professionalism, ethics and community responsibility. Local examples of building projects provide experiential learning through site visits together with teaching input from practising Engineers and other professionals in industry. These provide valuable 'real-world' case studies and are a motivational asset to the course.

Careers: Building or engineering companies in co-operation with architects, engineers and other building professionals in the planning and construction management of building projects; building facilities management.

Course Duration:4 years

Admission Requirements Year 12: The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows: Persons transferring from other courses or having overseas or at least equivalent standard to those listed above, should apply for admission in the normal manner. Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS - an overall band score of 6+, subject to individual profile; or TOEFL - a score of 550+, and a Test of Written English score of 5+.

COURSE STRUCTURE

The course is offered over four years on a full-time basis. Part-time study may be approved. However, the course cannot be completed solely on a part-time basis. Students must complete 384 credit points.

Engineering subject codes commence with 'V'.

Science subject codes commence with 'R'.

Year 1

Semester One

REP1001	ENGINEERING PHYSICS 1A	12
RMA1001	ENGINEERING MATHEMATICS 1A	12
VAN1011	EXPERIMENTATION AND COMPUTING	12
VAN1051	ENGINEERING PROFESSION	12

Semester Two

REP1003	ENGINEERING PHYSICS 1C	12
RMA1002	ENGINEERING MATHEMATICS 1B	12
VAN1022	SOLID MECHANICS 1	12
VAN1032	INTRODUCTION TO DESIGN	12

Year 2

Semester One

VAA2031	ARCHITECTURAL HISTORY & DESIGN	12
VAN2021	SOLID MECHANICS 2	12
VAN2041	THERMOFLUIDS	12
VAN2061	ENGINEERING MATERIALS	12

Semester Two

VAA2002	ELECTRICAL POWER SYSTEMS 1	12
VAC2042	HYDRAULICS	12
VAC2022	BUILDING MATERIALS AND CONSTRUCTION	12
VAN2032	ENGINEERING DESIGN	12

SERVICES STREAM

Year 3

Semester One

VAA3001	ELECTRICAL POWER SYSTEMS 2	12
VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAA3071	HVAC SYSTEMS 1	12
VAA3081	BUILDING CONSTRUCTION AND LEGISLATION 1	12

Semester Two

VAN3052	ENGINEERING MANAGEMENT	12
VAA3042	HYDRAULIC SERVICES SYSTEMS	12
VAA3032	ENVIRONMENTALLY SUSTAINABLE DESIGN 2	12
VAA3072	HVAC SYSTEMS 2	12

STRUCTURES STREAM

Year 3

Semester One

VAA3081	BUILDING CONSTRUCTION AND LEGISLATION 1	12
VAC3021	STRUCTURAL ANALYSIS	12
VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAC3061	GEOMECHANICS	12

Semester Two

VAA3042	HYDRAULIC SERVICES SYSTEMS	12
VAC3062	GEOTECHNICAL ENGINEERING	12
VAC3092	STRUCTURAL DESIGN	12
VAN3052	ENGINEERING MANAGEMENT	12

SERVICES STREAM

Year 4

Semester One

VAA4051	BUILDING QUANTITIES AND COSTS	6
VAA4071	HVAC SYSTEMS 3	6
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
Or #		
VCP5726	PROJECT PROCUREMENT MANAGEMENT	12
VCP5705	PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY	12
VAN4011	ENGINEERING PROJECT 1	12

Semester Two

VAA4082	BUILDING CONSTRUCTION AND LEGISLATION 2	6
VAA4092	BUILDING SYSTEMS DESIGN AND CONSTRUCTION	6
VCP5716	PROJECT DEVELOPMENT	12
VCP5736	FACILITY LIFE CYCLE COSTING	12
VAN4012	ENGINEERING PROJECT 2	12

STRUCTURES STREAM

Year 4

Semester One

VAA4051	BUILDING QUANTITIES AND COSTS	6
VCP5726	PROJECT PROCUREMENT MANAGEMENT	12

VCP5705	PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY	12
VAC4091	STRUCTURAL ENGINEERING DESIGN 1	6
VAN4011	ENGINEERING PROJECT 1	12

or

VAN4051	ENGINEERING PROJECT MANAGEMENT	12

Semester Two

VAA4082	BUILDING CONSTRUCTION AND LEGISLATION 2	6
VAA4092	BUILDING SYSTEMS DESIGN AND CONSTRUCTION	6
VCP5716	PROJECT DEVELOPMENT	12
VCP5736	FACILITY LIFE CYCLE COSTING	12
VAN4012	ENGINEERING PROJECT 2	12

Other Course Specific Notes

Assessment in subjects is designed to monitor a student's progress and achievements as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Discipline Leader in exceptional circumstances.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Degree with Honours

A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy, if they have achieved a minimum hour weighted average of 60 per cent over year levels 1 to 3, have not repeated a subject through levels 1 to 3 and have not been granted more than one year completion by compensation throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

Industrial Experience

Students are required to undertake a 12 week industrial work experience period during their course. At the end of third year, students will have an option to undertake a 12 week (minimum) integrated industry placement program. It is intended that this program will meet the 12 week industrial work experience requirements imposed upon all accredited Engineering degree courses by Engineers Australia.

Professional Recognition

The degree satisfies the requirements for accreditation by Engineers Australia and will be submitted for accreditation by the Australian Institute of Building.

Overseas Exchange Program

Each year two students from Victoria University who are enrolled in either Architectural or Building Engineering, are able to undertake studies with full credit for one semester in the third year of the Architectural Engineering degree program at the University of Nebraska-Omaha (UNO), U.S.A.

University scholarships are available to assist students in undertaking this exchange. The program at UNO is one of the newest and best resourced Architectural Engineering degrees in the U.S.A., having commenced in 1999 within new purpose-built buildings and facilities.

BACHELOR OF ENGINEERING (CIVIL ENGINEERING)

Course Code:EBCC
Campus: Footscray Park.
This course is for Continuing students only.

About this course: Civil Engineering is a broad-based discipline involving the planning, design, construction and management of a wide range of essential community infrastructure including, commercial and industrial buildings, water supply and wastewater systems, irrigation, drainage and flood protection systems, bridges, roads, highways and transportation systems, and port harbour and airport facilities. The course philosophy is very much based on a recognition of society's need for well-rounded engineers who not only have sound technical and communication skills but also a good understanding of the environmental, economic, social and political environment in which they must operate. The course is founded on a solid base of science and engineering fundamentals in the first two years, with emphasis then being given in years three and four to applied discipline-specific topics, design and project work. Substantial emphasis is given in a range of subjects to professionalism, ethics and community responsibility, team assignments, broad problem solving and communication skills, and the concepts of sustainability and sustainable engineering practices. A focus on local engineering examples, experiential learning and site visits, together with significant input from external industry-based lecturers, provides students with exposure to real world problems and is considered a motivational cornerstone of the course. There are two major streams in structural and water engineering running through the course, complemented by minor streams in geomechanics and transportation engineering. Environmental and management issues are covered in specific subjects but also more broadly by integration into a range of other subjects throughout the course. Subject streams are generally sequential within a well-defined structure. It is envisaged that this structure may be modified somewhat in the future with a view to further motivating students by allowing them a greater degree of flexibility and specialisation, once a firm foundation has been established in the early years of the course. The incorporation of more flexibility should also allow students to remedy any perceived deficiencies in the more basic communication and technical skills. A study abroad exchange program is under investigation with the Department of Civil Engineering at the University of Nebraska at Omaha, Nebraska, USA.

Course Objectives: The course is designed to develop skills for the application of engineering principles of planning, design, construction and management of buildings, roads, water supply and all other major community amenities.

Careers: A wide range of careers involving planning, design, construction and engineering management in private industry or with government authorities.

Course Duration: 4 years

Admission Requirements Year 12: The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level, and are as follows. Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner. A preliminary interview with the Head of School concerned is advisable for such applicants. Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS - an overall band score of 6+, subject to individual profile, or TOEFL - a score of 550+, and a Test of Written English (TWE) score of 5+.

COURSE STRUCTURE

The course is offered over four years on a full-time basis. Part-time study may be approved. However the course cannot be completed solely on a part-time basis. Students must complete 384 credit points.

Engineering subject codes commence with 'V'.

Science subject codes commence with 'R'.

Year 1

Semester One

REP1001	ENGINEERING PHYSICS 1A	12
RMA1001	ENGINEERING MATHEMATICS 1A	12
VAN1011	EXPERIMENTATION AND COMPUTING	12
VAN1051	ENGINEERING PROFESSION	12

Semester Two

REP1003	ENGINEERING PHYSICS 1C	12
RMA1002	ENGINEERING MATHEMATICS 1B	12
VAN1022	SOLID MECHANICS 1	12
VAN1032	INTRODUCTION TO DESIGN	12

Year 2

Semester One

VAC2071	SURVEYING	12
VAN2021	SOLID MECHANICS 2	12
VAN2041	THERMOFLUIDS	12
VAN2061	ENGINEERING MATERIALS	12

Year 2

Semester Two

VAC2022	BUILDING MATERIALS AND CONSTRUCTION	12
VAC2042	HYDRAULICS	12
VAC2072	HIGHWAY ENGINEERING	12
VAN2032	ENGINEERING DESIGN	12

Year 3

Semester One

VAC3021	STRUCTURAL ANALYSIS	12
VAC3031	CIVIL ENGINEERING DESIGN 1	12
VAC3041	HYDROLOGY AND WATER RESOURCES	12
VAC3061	GEOMECHANICS	12

Year 3

Semester Two

VAC3042	HYDRAULIC ENGINEERING	12
VAC3062	GEOTECHNICAL ENGINEERING	12
VAC3092	STRUCTURAL DESIGN	12
VAN3052	ENGINEERING MANAGEMENT	12

Year 4

Semester One

VAC4071	TRANSPORTATION ENGINEERING	6
VAC4081	ENVIRONMENTAL ENGINEERING 1	12
VAC4091	STRUCTURAL ENGINEERING DESIGN 1	6
VAN4011	ENGINEERING PROJECT 1	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12

Year 4

Semester Two

VAC4032	CIVIL ENGINEERING DESIGN 2	12
VAC4072	ENVIRONMENTAL PLANNING AND DESIGN	6
VAC4082	ENVIRONMENTAL ENGINEERING 2	12
VAC4092	STRUCTURAL ENGINEERING DESIGN 2	6
VAN4012	ENGINEERING PROJECT 2	12

Electives

May be taken to a value of 6, 12 or 18 CP depending on which of VAC4072, VAC4091 and/or VAC4092 is done (18 max)

*Approved Electives from within the College of Engineering and Science

VAA2031	ARCHITECTURAL HISTORY & DESIGN	12
VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAA3042	HYDRAULIC SERVICES SYSTEMS	12
VAA3081	BUILDING CONSTRUCTION AND LEGISLATION 1	12
VAA4051	BUILDING QUANTITIES AND COSTS	6
VAA4082	BUILDING CONSTRUCTION AND LEGISLATION 2	6
VAM2011	COMPUTATIONS AND ENGINEERING ANALYSIS	12

Subject VEM2012 not found

Electives from outside the College of Engineering and Science

(Subject to approval by Course Coordinator)

Other Course Specific Notes Assessment in subjects is designed to monitor a student's progress and achievements as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject. Assessment is by a combination of written assignments, tests, laboratory work and examinations. Supplementary assessment is not normally available in any subject except at the discretion of the Head of School in exceptional circumstances. Special Consideration in assessment may be granted on the grounds defined by the University Statutes. Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made. Degree with Honours A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy, if they have achieved a minimum hour weighted average of 60 per cent over year levels 1 to 3, have not repeated a subject throughout levels 1 to 3 and have not been granted more than one year completion by compensation throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4. Industrial Experience Candidates applying for the award of a degree in civil engineering must ensure that they have submitted for approval evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy Engineers Australia requirements. Professional Recognition Engineers Australia has granted full recognition for the Bachelor of Engineering in Civil Engineering. Recognition is a requirement for Graduate Membership of Engineers Australia and additionally for equivalent membership of many overseas professional engineering institutions. Overseas Exchange Program Victoria University has exchange agreements with universities in many countries, some of which are the U.S.A., Canada, Mexico, United Kingdom and many European and Asian countries. For those students who do wish to study abroad, there is the opportunity to experience living in a different culture and environment, and to develop self-responsibility and reliance skills. Many students achieve improved results in their remaining studies after returning home, having developed a clearer perception of their future career with a stronger determination to succeed.

BACHELOR OF ENGINEERING (ARCHITECTURAL ENGINEERING)

Course Code:EBDA
Campus: Footscray Park.

About this course: The VU Engineering PBL model is built on the learning principles of Active Learning (problem/project/practice based), Collaborative Learning (self-directed and team-based), and Integrative Learning (interdisciplinary knowledge and skills). Interwoven with these three principles are those of 'Engagement' and 'Practice'. In line with the model, the first two years of the course have a strong emphasis on managing the transition of students from a secondary education environment that emphasises passive learning to a higher education environment that is built around problem/project/practice work. For this reason, the course uses shorter problems in first year before moving on to longer community-based projects in year 2, industry-based projects in year 3, and practice on industry projects in year 4. The course has also built in a range of student support mechanisms in learning, language, mathematics and technical skills.

Course Objectives: The objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge;
- have a broad appreciation of building technology and construction techniques;
- can offer specialised ability to design building structures in steel, concrete and timber; or specialised design skills in environmental services systems including lighting, electrical power, air conditioning, ventilation, water supply distribution and fire protection/life safety systems;
- can develop creative, practical and sustainable solutions for the design of building structural or building services systems;
- can manage people, finances and resources for building projects;
- can communicate appropriately and effectively in different modes with different audiences;
- can work independently and collaboratively;
- can understand community needs in the context of societal aspirations and expectations for sustainability and the built environment;
- have both the skills and motivation to continue learning as professionals; and

- are work-ready and thus attractive to prospective employers in the building design industry.

Architectural Engineering at Victoria University is the first program in Architectural Engineering in Australia to receive full accreditation from Engineers Australia.

Careers: Architectural Engineering graduates will have enhanced skills for careers in:

- advanced environmental services systems design including air conditioning (HVAC);
- interior lighting design;
- sustainable building design;
- green star auditing;
- conducting building energy audits and conservation studies;
- simulation of building environmental systems performance;
- building structural design including assessment of buildings for reuse;
- fire and life safety systems design;
- design of water systems, including distribution, reclaim and recycling;
- conducting project feasibility assessments and cost estimating;
- construction planning, management and project supervision;
- engineering consultations and investigations;
- facilities management;
- risk assessment for building insurance;
- support for preservation architecture;
- building renovation and refurbishment; and
- computer aided design and drawing.

Course Duration:4 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in Mathematical methods (CAS) or specialist mathematics. Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard should apply for admission in the normal manner.

Admission Requirements International: Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: ¿ IELTS - an overall band score of 6+ or equivalent, subject to individual profile.

Admission Requirements Mature Age: Mature age students demonstrating equivalence to the above can apply in the normal manner.

Admission Requirements VET: Students with a suitable VET qualification can apply for admission in the normal manner.

COURSE STRUCTURE

The Bachelor of Engineering (Architectural Engineering) is a 384 credit point degree.

Year 1, Semester 1

ENF1101	ENGINEERING MATHEMATICS 1	12
ENF1102	ENGINEERING PHYSICS 1	12
ENF1103	ENGINEERING AND THE COMMUNITY	12
ENF1104	PROBLEM SOLVING FOR ENGINEERS	12

Year 1, Semester 2

ENF1201	ENGINEERING MATHEMATICS 2	12
ENF1202	ENGINEERING PHYSICS 2	12
ENF1204	INTRODUCTION TO ENGINEERING DESIGN	12
ENF1205	ENGINEERING FUNDAMENTALS	12

Year 2, Semester 1

VAN2041	THERMOFLUIDS	12
VAC2011	ENGINEERING MATERIALS & CONSTRUCTION	12
VAC2121	SOLID MECHANICS	12
VAA2031	ARCHITECTURAL HISTORY & DESIGN	12

Year 2, Semester 2

VAC2042	HYDRAULICS	12
VAA2002	ELECTRICAL POWER SYSTEMS 1	12
VAC2092	INTRODUCTION TO STRUCTURAL ENGINEERING DESIGN	12
VAA2082	BUILDING CONSTRUCTION AND CONTROL 1	12

Year 3, Semester 1

STRUCTURES STREAM

VAC3061	GEOMECHANICS	12
VAC3021	STRUCTURAL ANALYSIS	12
VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAA3181	BUILDING CONSTRUCTION AND CONTROL 2	12

SERVICES STREAM

VAA3001	ELECTRICAL POWER SYSTEMS 2	12
VAA3071	HVAC SYSTEMS 1	12
VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAA3181	BUILDING CONSTRUCTION AND CONTROL 2	12

Year 3, Semester 2

STRUCTURES STREAM

VAC3062	GEOTECHNICAL ENGINEERING	12

VAC3192	STRUCTURAL ENGINEERING DESIGN 1	12
VAN3052	ENGINEERING MANAGEMENT	12
VAA3042	HYDRAULIC SERVICES SYSTEMS	12

SERVICES STREAM

VAA3032	ENVIRONMENTALLY SUSTAINABLE DESIGN 2	12
VAA3072	HVAC SYSTEMS 2	12
VAN3052	ENGINEERING MANAGEMENT	12
VAA3042	HYDRAULIC SERVICES SYSTEMS	12

Year 4, Semester 1

STRUCTURES STREAM

VAA4121	STRUCTURAL DYNAMICS	12
VAC4191	STRUCTURAL ENGINEERING DESIGN 2	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
VAN4011	ENGINEERING PROJECT 1	12

SERVICES STREAM

VAA4001	ARCHITECTURAL LIGHTING AND COMMUNICATIONS SYSTEMS	12
VAA4171	HVAC SYSTEMS 3	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
VAN4011	ENGINEERING PROJECT 1	12

Year 4, Semester 2

STRUCTURES STREAM

VAC4192	STRUCTURAL ENGINEERING DESIGN 3	12
VAA4182	BUILDING SYSTEMS DESIGN & COSTING	12
VAA4042	BUILDING FIRE SAFETY SYSTEMS	12
VAN4012	ENGINEERING PROJECT 2	12

SERVICES STREAM

VAA4042	BUILDING FIRE SAFETY SYSTEMS	12
VAA4182	BUILDING SYSTEMS DESIGN & COSTING	12
VAA4032	ENVIRONMENTALLY SUSTAINABLE DESIGN 3	12
VAN4012	ENGINEERING PROJECT 2	12

Industrial Experience Candidates applying for the award of Bachelor of Engineering (Architectural Engineering) must ensure that they have submitted for approval, evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy Engineers Australia requirements. Degree with Honours Program A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of the Engineering program. To be eligible for consideration for a degree with honours a student will: (a) have achieved a minimum weighted average of 60% over year levels 1 to 3; (b) not have repeated a Unit of Study throughout year levels 2 to 3; (c) not have been granted more than one conceded pass throughout the duration of the course; and (d) discretion to award honours grading that do not meet criteria above will rest with the Course Coordinator. Eligibility for admission to a degree with honours will be determined at the end of year level 3 for students who are enrolled on a full time basis or, a part time basis or, who have transferred into the course with exemptions. The level of awarded honours will be determined by the hour weighted average for year level 4. The following grading will apply: H1 First Class honours 80-100 H2A Second Class Honours, Upper 70-79 H2B Second Class Honours, Lower 60-69 P Pass 50-59

BACHELOR OF ENGINEERING (BUILDING ENGINEERING)

Course Code:EBDB
Campus: Footscray Park.

About this course: The VU Engineering PBL model is built on the learning principles of Active Learning (problem/project/practice based), Collaborative Learning (self-directed and team-based), and Integrative Learning (interdisciplinary knowledge and skills). Interwoven with these three principles are those of 'Engagement' and 'Practice'. In line with the model, the first two years of the course have a strong emphasis on managing the transition of students from a secondary education environment that emphasises passive learning to a higher education environment that is built around problem/project/practice work. For this reason, the course uses shorter problems in first year before moving on to longer community-based projects in year 2, industry-based projects in year 3, and practice on industry projects in year 4. The course has also built in a range of student support mechanisms in learning, language, mathematics and technical skills.

Course Objectives: In the context of centuries of human enterprise in constructing the built environment, Building Engineering is a recent and distinctly modern profession. Building Engineers are involved in the entire building process, with a primary focus on building construction planning and project management studies. They require a multi-disciplinary training program that includes an understanding of construction technology, legal/statutory and financial procedures as well as an understanding of structural systems, HVAC, electrical power systems and sustainable design approaches relevant to buildings. The course includes examples of current building projects together with teaching input from practicing engineers and other professionals in industry. The objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge;
- can develop creative, practical and sustainable solutions for planning and managing construction of building structural and building services systems;
- can communicate appropriately and effectively in different modes with different audiences;
- can work independently and collaboratively;
- can understand community needs in the context of societal aspirations and expectations for sustainability and the built environment;

- have both the skills and motivation to continue learning as professionals; and
- are work-ready and thus attractive to prospective employers in the building construction industry.

Careers: When students graduate, they can be employed in both the private and public sector of the building industry in Australia. The course has been offered for more than 25 years and is well accepted by industry. There is continuing need for new and refurbished building infrastructure which provides a rich and varied source of employment opportunities for graduates. A number of graduates gain employment overseas, particularly in South-East Asia. In the private sector, Building Engineers are employed in construction and project management companies, as facility managers and in consulting engineering practices. Companies responsible for the design of building structures and services systems also employ building engineers as those responsible for building certification. Project planning, feasibility and management companies find Building Engineers ideally suited to this role in the building process. Allied areas such as building construction and services equipment suppliers are increasingly seeking Building Engineers for roles as technical sales engineers. In the public sector federal, state and local government and other semi-government bodies employ Building Engineers to provide essential community facilities and services in housing, health and recreation, public security and defense facilities. This course offered by Victoria University is unique in Austalasia.

Course Duration:4 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in Mathematical methods (CAS) or specialist mathematics. Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard should apply for admission in the normal manner.

Admission Requirements International: Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: ¿ IELTS - an overall band score of 6+ or equivalent, subject to individual profile.

Admission Requirements Mature Age: Mature age students demonstrating equivalence to the above can apply in the normal manner.

Admission Requirements VET: Students with a suitable VET qualification can apply for admission in the normal manner.

COURSE STRUCTURE

The Bachelor of Engineering (Building Engineering) is a 384 credit point degree.

Year 1, Semester 1

ENF1101	ENGINEERING MATHEMATICS 1	12
ENF1102	ENGINEERING PHYSICS 1	12
ENF1103	ENGINEERING AND THE COMMUNITY	12
ENF1104	PROBLEM SOLVING FOR ENGINEERS	12

Year 1, Semester 2

ENF1201	ENGINEERING MATHEMATICS 2	12
ENF1202	ENGINEERING PHYSICS 2	12
ENF1204	INTRODUCTION TO ENGINEERING DESIGN	12
ENF1205	ENGINEERING FUNDAMENTALS	12

Year 2, Semester 1

VAN2041	THERMOFLUIDS	12
VAC2011	ENGINEERING MATERIALS & CONSTRUCTION	12
VAC2121	SOLID MECHANICS	12
VAA2031	ARCHITECTURAL HISTORY & DESIGN	12

Year 2, Semester 2

VAC2042	HYDRAULICS	12
VAA2002	ELECTRICAL POWER SYSTEMS 1	12
VAC2092	INTRODUCTION TO STRUCTURAL ENGINEERING DESIGN	12
VAA2082	BUILDING CONSTRUCTION AND CONTROL 1	12

Year 3, Semester 1

STRUCTURES STREAM

VAC3061	GEOMECHANICS	12
VAC3021	STRUCTURAL ANALYSIS	12
VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAA3181	BUILDING CONSTRUCTION AND CONTROL 2	12

SERVICES STREAM

VAA3001	ELECTRICAL POWER SYSTEMS 2	12
VAA3071	HVAC SYSTEMS 1	12
VAA3031	ENVIRONMENTALLY SUSTAINABLE DESIGN 1	12
VAA3181	BUILDING CONSTRUCTION AND CONTROL 2	12

Year 3, Semester 2

STRUCTURES STREAM

VAC3062	GEOTECHNICAL ENGINEERING	12
VAC3192	STRUCTURAL ENGINEERING DESIGN 1	12
VAN3052	ENGINEERING MANAGEMENT	12
VAA3042	HYDRAULIC SERVICES SYSTEMS	12

SERVICES STREAM

VAA3032	ENVIRONMENTALLY SUSTAINABLE DESIGN 2	12
VAA3072	HVAC SYSTEMS 2	12
VAN3052	ENGINEERING MANAGEMENT	12
VAA3042	HYDRAULIC SERVICES SYSTEMS	12

Year 4, Semester 1

STRUCTURES STREAM

VCP5705	PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY	12
VCP5726	PROJECT PROCUREMENT MANAGEMENT	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
VAN4011	ENGINEERING PROJECT 1	12

SERVICES STREAM

VCP5705	PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY	12
VCP5726	PROJECT PROCUREMENT MANAGEMENT	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
VAN4011	ENGINEERING PROJECT 1	12

Year 4, Semester 2

STRUCTURES STREAM

VCP5736	FACILITY LIFE CYCLE COSTING	12
VAA4182	BUILDING SYSTEMS DESIGN & COSTING	12
VAA4042	BUILDING FIRE SAFETY SYSTEMS	12
VAN4012	ENGINEERING PROJECT 2	12

SERVICES STREAM

VCP5736	FACILITY LIFE CYCLE COSTING	12
VAA4182	BUILDING SYSTEMS DESIGN & COSTING	12
VAA4032	ENVIRONMENTALLY SUSTAINABLE DESIGN 3	12
VAN4012	ENGINEERING PROJECT 2	12

Industrial Experience Candidates applying for the award of Bachelor of Engineering (Building Engineering) must ensure that they have submitted for approval, evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy Engineers Australia requirements. Degree with Honours Program A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of the Engineering program. To be eligible for consideration for a degree with honours a student will: (a) have achieved a minimum weighted average of 60% over year levels 1 to 3; (b) not have repeated a Unit of Study throughout year levels 2 to 3; (c) not have been granted more than one conceded pass throughout the duration of the course; and (d) discretion to award honours grading that do not meet criteria above will rest with the Course Coordinator. Eligibility for admission to a degree with honours will be determined at the end of year level 3 for students who are enrolled on a full time basis or, a part time basis or, who have transferred into the course with exemptions. The level of awarded honours will be determined by the hour weighted average for year level 4. The following grading will apply: H1 First Class honours 80-100 H2A Second Class Honours, Upper 70-79 H2B Second Class Honours, Lower 60-69 P Pass 50-59

BACHELOR OF ENGINEERING (CIVIL ENGINEERING)

Course Code:EBDC
Campus: Footscray Park.

About this course: The VU Engineering PBL model is built on the learning principles of Active Learning (problem/project/practice based), Collaborative Learning (self-directed and team-based), and Integrative Learning (interdisciplinary knowledge and skills). Interwoven with these three principles are those of `Engagement¿ and `Practice¿. In line with the model, the first two years of the course have a strong emphasis on managing the transition of students from a secondary education environment that emphasises passive learning to a higher education environment that is built around problem/project/practice work. For this reason, the course uses shorter problems in first year before moving on to longer community-based projects in year 2, industry-based projects in year 3, and practice on industry projects in year 4. The course has also built in a range of student support mechanisms in learning, language, mathematics and technical skills.

Course Objectives: The objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge;
- can develop creative and practical solutions to engineering problems;
- can communicate appropriately and effectively in different modes with different audiences;
- can work independently and collaboratively;
- can understand community needs in the context of societal aspirations and expectations;
- have both the skills and motivation to continue learning as professionals; and
- are work-ready and thus attractive to prospective employers.

Careers:A wide range of private and public sector careers involving the planning, design, construction, management and/or rehabilitation of essential community infrastructure including residential / commercial / industrial buildings, water supply and wastewater systems, irrigation / drainage / flood protection systems, bridges / roads / transport systems, and ports/ harbours and airport facilities.

Course Duration:4 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in Mathematical methods (CAS) or specialist mathematics. Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard should apply for admission in the normal manner.

Admission Requirements International: Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS - an overall band score of 6+ or equivalent, subject to individual profile.

Admission Requirements Mature Age: Mature age students demonstrating equivalence to the above can apply in the normal manner.

Admission Requirements VET: Students with a suitable VET qualification can apply for admission in the normal manner.

COURSE STRUCTURE

The Bachelor of Engineering (Civil Engineering) is a 384 credit point degree.

Year 1, Semester 1

ENF1101	ENGINEERING MATHEMATICS 1	12
ENF1102	ENGINEERING PHYSICS 1	12
ENF1103	ENGINEERING AND THE COMMUNITY	12
ENF1104	PROBLEM SOLVING FOR ENGINEERS	12

Year 1, Semester 2

ENF1201	ENGINEERING MATHEMATICS 2	12
ENF1202	ENGINEERING PHYSICS 2	12
ENF1204	INTRODUCTION TO ENGINEERING DESIGN	12
ENF1205	ENGINEERING FUNDAMENTALS	12

Year 2, Semester 1

VAN2041	THERMOFLUIDS	12
VAC2011	ENGINEERING MATERIALS & CONSTRUCTION	12
VAC2121	SOLID MECHANICS	12
VAC2171	ENGINEERING SURVEYING	12

Year 2, Semester 2

VAC2042	HYDRAULICS	12
VAC2072	HIGHWAY ENGINEERING	12
VAC2092	INTRODUCTION TO STRUCTURAL ENGINEERING DESIGN	12
VAC2032	CIVIL PROJECT	12

Year 3, Semester 1

VAC3061	GEOMECHANICS	12
VAC3021	STRUCTURAL ANALYSIS	12
VAC3031	CIVIL ENGINEERING DESIGN 1	12
VAC3041	HYDROLOGY AND WATER RESOURCES	12

Year 3, Semester 2

VAC3062	GEOTECHNICAL ENGINEERING	12
VAC3192	STRUCTURAL ENGINEERING DESIGN 1	12
VAN3052	ENGINEERING MANAGEMENT	12
VAC3042	HYDRAULIC ENGINEERING	12

Year 4, Semester 1

VAC4081	ENVIRONMENTAL ENGINEERING 1	12
VAC4191	STRUCTURAL ENGINEERING DESIGN 2	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
VAN4011	ENGINEERING PROJECT 1	12

Year 4, Semester 2

VAC4082	ENVIRONMENTAL ENGINEERING 2	12
VAC4172	URBAN DEVELOPMENT AND TRANSPORTATION	12
VAC4032	CIVIL ENGINEERING DESIGN 2	12
VAN4012	ENGINEERING PROJECT 2	12

Industrial Experience Candidates applying for the award of Bachelor of Engineering (Civil Engineering) must ensure that they have submitted for approval, evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy Engineers Australia requirements. Degree with Honours Program A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of the Engineering program. To be eligible for consideration for a degree with honours a student will: (a) have achieved a minimum weighted average of 60% over year levels 1 to 3; (b) not have repeated a Unit of Study throughout year levels 2 to 3; (c) not have been granted more than one conceded pass throughout the duration of the course; and (d) discretion to award honours grading that do not meet criteria above will rest with the Course Coordinator. Eligibility for admission to a degree with honours will be determined at the end of year level 3 for students who are enrolled on a full time basis or, a part time basis or, who have transferred into the course with exemptions. The level of awarded honours will be determined by the hour weighted average for year level 4. The following grading will apply: H1 First Class honours 80-100 H2A Second Class Honours, Upper 70-79 H2B Second Class Honours, Lower 60-69 P Pass 50-59

BACHELOR OF ENGINEERING (ELECTRICAL AND ELECTRONIC ENGINEERING)

Course Code:EBDE
Campus: Footscray Park.

About this course: The Bachelor of Engineering in Electrical and Electronic Engineering is a flexible degree that allows students to specialise in four disciplinary areas. Embedded Systems, Microelectronic Systems, Communications Systems and Power

Systems Engineering. The course is delivered using a Problem Based Learning (PBL) methodology which uses real world problems as a significant part of the learning process. In Year 2 projects will involve students interacting with a community organisation or school, while in later years the focus will be on working with an industry partner. The projects will be based on the identified needs of the industry or community partners. The projects allow the student to apply their theoretical and technical engineering knowledge and skills in real contexts, develop and reflect on their professional attributes, and learn from the expertise, experience and perspectives of the project partners. The first three years of the course develop the basic concepts in electrical and electronic engineering, computer systems and programming, together with related engineering sciences, mathematics, design projects and laboratory studies. Students have the opportunity to choose their field of specialisation in fourth year of the course. The main objectives of the course are to: provide an integrated foundation for electrical disciplinary studies and course specialisation into the particular areas of Embedded Systems, Microelectronic Systems, Communication Systems and Power Systems Engineering; develop attitudes of personal initiative and enquiry in students that they may continue to further education and meet the technological changes in their profession; develop oral and written communications and an understanding of society and the engineer's role in society; provide for professional recognition by the Engineers Australia and other professional bodies.

Course Objectives: The objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge;
- can develop creative and practical solutions to engineering problems;
- can communicate appropriately and effectively in different modes with different audiences;
- can work independently and collaboratively;
- can understand community needs in the context of societal aspirations and expectations;
- have both the skills and motivation to continue learning as professionals; and
- are work-ready and thus attractive to prospective employers.

Careers: Professional Electrical Engineers are employed in a wide range of industries such as communications, power, microelectronics and embedded systems engineering.

Course Duration: 4 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in Mathematical methods (CAS) or specialist mathematics. Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard should apply for admission in the normal manner.

Admission Requirements International: Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: ¿ IELTS - an overall band score of 6+ or equivalent, subject to individual profile.

Admission Requirements Mature Age: Mature age students demonstrating equivalence to the above can apply in the normal manner.

Admission Requirements VET: Students with a suitable VET qualification can apply for admission in the normal manner.

COURSE STRUCTURE

The Bachelor of Engineering (Electrical and Electronic Engineering) is a 384 credit point degree.

Year 1, Semester 1

ENF1101	ENGINEERING MATHEMATICS 1	12
ENF1102	ENGINEERING PHYSICS 1	12
ENF1103	ENGINEERING AND THE COMMUNITY	12
ENF1104	PROBLEM SOLVING FOR ENGINEERS	12

Year 1, Semester 2

ENF1201	ENGINEERING MATHEMATICS 2	12
ENF1202	ENGINEERING PHYSICS 2	12
ENF1204	INTRODUCTION TO ENGINEERING DESIGN	12
ENF1205	ENGINEERING FUNDAMENTALS	12

Year 2, Semester 1

ENE2101	FUNDAMENTALS OF ELECTRICAL & ELECTRONIC CIRCUITS	12
ENE2102	DIGITAL & COMPUTER SYSTEMS	12
ENE2100	ENGINEERING DESIGN AND PRACTICE 2A	24

Year 2, Semester 2

ENE2201	LINEAR SYSTEMS WITH MATLAB APPLICATIONS	12
ENE2202	ELECTRONIC SYSTEMS	12
ENE2200	ENGINEERING DESIGN AND PRACTICE 2B	24

Year 3, Semester 1

ENE3101	SYSTEMS ENGINEERING	12
ENE3102	SYSTEMS & APPLICATIONS	12
ENE3100	ENGINEERING DESIGN AND PRACTICE 3A	24

Year 3, Semester 2

ENE3201	ELECTRICAL MACHINES AND CONTROL	12
ENE3202	EMBEDDED AND NETWORKED SYSTEMS	12
ENE3200	ENGINEERING DESIGN AND PRACTICE 3B	24

Year 4, Semester 1

ENE4101	ANALOG AND OPTOELECTRONICS	12
ENE4100	ENGINEERING DESIGN AND PRACTICE 4A	24

1 ELECTIVE UNIT (see list Yr4 Sem2) OR

1 STREAM SPECIALISATION UNIT FROM THE FOLLOWING

COMMUNICATION SYSTEMS ENGINEERING

ECS4100	ANALOG AND DIGITAL TRANSMISSION	12

EMBEDDED SYSTEMS ENGINEERING

EES4100	OPERATING SYSTEMS AND NETWORK PROGRAMMING	12

MICROELECTRONIC SYSTEMS ENGINEERING

EMS4100	IC DESIGN AND EDA TOOLS	12

POWER SYSTEMS ENGINEERING

EPS4100	ELECTRICAL POWER SYSTEMS, ANALYSIS AND OPERATION	12

Year 4, Semester 2

ENE4200	ENGINEERING DESIGN AND PRACTICE 4B	24

1 STREAM SPECIALISATION UNIT FROM THE FOLLOWING

PLUS 1 ELECTIVE UNIT

OR 2 ELECTIVE UNITS

COMMUNICATION AND SYSTEMS ENGINEERING

ECS4200	SIGNAL PROCESSING AND DIGITAL MODULATION	12

EMBEDDED SYSTEMS ENGINEERING

EES4200	REAL TIME ASIC BASED SYSTEMS	12

MICROELECTRONIC SYSTEMS ENGINEERING

EMS4200	ANALOG AND MIXED SIGNAL DESIGN	12

POWER SYSTEMS ENGINEERING

EPS4201	ELECTRIC ENERGY SYSTEMS PROTECTION AND POWER ELECTRONICS	12

ELECTIVE UNITS

ENE4201	MEASUREMENT SYSTEMS ENGINEERING	12
ENE4202	WIRELESS AND BROADBAND COMMUNICATIONS	12
ENE4204	COMPUTER AND FUZZY LOGIC CONTROL SYSTEMS	12
ENE4205	DIGITAL SYSTEM DESIGN	12
ENE4207	ALTERNATIVE ENERGY SYSTEMS AND POWER SYSTEM COMMUNICATION	12
VEB4006	DIRECTED STUDIES IN ELECTRICAL ENGINEERING 1	6
VEB4012	DIRECTED STUDIES IN ELECTRICAL ENGINEERING 2	12

Note: Units elected outside the above list require approval of the Course Coordinator.

Elective Units: Students in a Specialisation Stream may choose from the units in another Specialisation Stream or from the electives list or from outside the College of Engineering and Science. Units from outside the College are subject to approval from the course coordinator.

Industrial Experience Candidates applying for the award of Bachelor of Engineering (Electrical and Electronic Engineering) must ensure that they have submitted for approval, evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy Engineers Australia requirements. Degree with Honours Program A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of the Engineering program. To be eligible for consideration for a degree with honours a student will: (a) have achieved a minimum weighted average of 60% over year levels 1 to 3; (b) not have repeated a Unit of Study throughout year levels 2 to 3; (c) not have been granted more than one conceded pass throughout the duration of the course; and (d) discretion to award honours grading that do not meet criteria above will rest with the Course Coordinator. Eligibility for admission to a degree with honours will be determined at the end of year level 3 for students who are enrolled on a full time basis or, a part time basis or, who have transferred into the course with exemptions. The level of awarded honours will be determined by the hour weighted average for year level 4. The following grading will apply: H1 First Class honours 80-100 H2A Second Class Honours, Upper 70-79 H2B Second Class Honours, Lower 60-69 P Pass 50-59

BACHELOR OF ENGINEERING (MECHANICAL ENGINEERING)

Course Code:EBDM
Campus: Footscray Park.

About this course: The Mechanical Engineering degree at VU is designed to provide the broad education required for a successful career in such widespread areas as manufacturing; design of machines and industrial processes; machine health monitoring; energy and thermal systems; air, marine and land-based transportation systems; aerodynamics and fluid mechanics; creation and design of medical devices; resources and mining; and computer-aided engineering. Initial focus is on engineering principles and analysis and the role of engineers in society. In higher years, knowledge gained is applied to real-world engineering projects and problems as well as management. Completion of a major industry or research-oriented project and a minimum of twelve weeks¿ relevant industrial experience are required to graduate Work experience opportunities are available for selected students.

Course Objectives: The objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge;
- can develop creative and practical solutions to engineering problems;
- can communicate appropriately and effectively in different modes with different audiences;
- can work independently and collaboratively;

- can understand community needs in the context of societal aspirations and expectations;
- have both the skills and motivation to continue learning as professionals; and
- are work-ready and thus attractive to prospective employers.

Careers: The Mechanical Engineering degree at VU is designed to provide the broad education required for a successful Engineering and Management career in such widespread areas as manufacturing; design of machines and industrial processes; machine health monitoring; energy and thermal systems; air, marine and land-based transportation systems; aerodynamics and fluid mechanics; creation and design of medical devices; resources and mining; Defence; and computer-aided engineering.

Course Duration:4 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in Mathematical methods (CAS) or specialist mathematics. Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard should apply for admission in the normal manner.

Admission Requirements International: Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS - an overall band score of 6+ or equivalent, subject to individual profile;

Admission Requirements Mature Age: Applicants who have not completed Year 12 but who possess appropriate educational qualifications, work or life experiences which would enable them to successfully undertake the course, will be considered for admission.

Admission Requirements VET: Recognition of Prior learning is available for studies at tertiary level. Pathways are also available for students who have successfully completed the appropriate VET studies. See details at: http://www.vu.edu.au/courses/study-pathways

COURSE STRUCTURE

The Bachelor of Engineering (Mechanical Engineering) is a 384 credit point Bachelor's degree. Full-time study requires enrolment in four units (48 CP) per semester.

Year 1, Semester 1

ENF1101	ENGINEERING MATHEMATICS 1	12
ENF1102	ENGINEERING PHYSICS 1	12
ENF1104	PROBLEM SOLVING FOR ENGINEERS	12
ENF1103	ENGINEERING AND THE COMMUNITY	12

Year 1, Semester 2

ENF1201	ENGINEERING MATHEMATICS 2	12
ENF1202	ENGINEERING PHYSICS 2	12
ENF1204	INTRODUCTION TO ENGINEERING DESIGN	12
ENF1205	ENGINEERING FUNDAMENTALS	12

Year 2, Semester 1

VAN2041	THERMOFLUIDS	12
VAM2111	INTRODUCTION TO ENGINEERING MATERIALS	12
VAM2121	MECHANICS OF ENGINEERING MATERIALS	12
VAM2131	ENGINEERING ANALYSIS	12

Year 2, Semester 2

VAM2112	THERMODYNAMICS 1	12
VAM2122	STRESS ANALYSIS	12
VAM2132	MANUFACTURING MATERIALS	12
VAM2142	MECHANICAL ENGINEERING DESIGN	12

Year 3, Semester 1

VAM3111	DESIGN OF MECHANICAL SYSTEMS	12
VAM3121	THERMODYNAMICS 2	12
VAM3131	FLUID MECHANICS 1	12
VAM3071	DYNAMICS	12

Year 3, Semester 2

VAM3112	ELECTRICAL ENGINEERING	12
VAM3122	FLUID MECHANICS 2	12
VAN3052	ENGINEERING MANAGEMENT	12
VAM3072	MECHANICAL VIBRATIONS	12

Year 4, Semester 1

VAM4111	ADVANCED MECHANICS 1	12
VAM4121	FINITE ELEMENT ANALYSIS	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
VAN4011	ENGINEERING PROJECT 1	12

Year 4, Semester 2

VAM4112	ADVANCED MECHANICS 2	12
VAM4122	ENGINEERING DESIGN AND OPTIMISATION	12
VAM4132	ADVANCED ENGINEERING ANALYSIS	12

VAN4012	ENGINEERING PROJECT 2	12

Industrial Experience Candidates applying for the award of Bachelor of Engineering (Mechanical Engineering) must ensure that they have submitted for approval, evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy Engineers Australia requirements. Degree with Honours Program A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of the Engineering program. To be eligible for consideration for a degree with honours a student will: (a) have achieved a minimum weighted average of 60% over year levels 1 to 3; (b) not have repeated a Unit of Study throughout year levels 2 to 3; (c) not have been granted more than one conceded pass throughout the duration of the course; and (d) discretion to award honours grading that do not meet criteria above will rest with the Course Coordinator. Eligibility for admission to a degree with honours will be determined at the end of year level 3 for students who are enrolled on a full time basis or, a part time basis or, who have transferred into the course with exemptions. The level of awarded honours will be determined by the hour weighted average for year level 4. The following grading will apply: H1 First Class honours 80-100 H2A Second Class Honours, Upper 70-79 H2B Second Class Honours, Lower 60-69 P Pass 50-59

BACHELOR OF ENGINEERING SCIENCE (ELECTRICAL AND ELECTRONIC ENGINEERING)

Course Code:EBDT
Campus: Footscray Park.

About this course: The VU Engineering PBL model is built on the learning principles of Active Learning (problem/project/practice based), Collaborative Learning (self-directed and team-based), and Integrative Learning (interdisciplinary knowledge and skills). Interwoven with these three principles are those of 'Engagement' and 'Practice'. In line with the model, the first two years of the course have a strong emphasis on managing the transition of students from a secondary education environment that emphasises passive learning to a higher education environment that is built around problem/project/practice work. For this reason, the course uses shorter problems in first year before moving on to longer community-based projects in year 2, industry-based projects in year 3, and practice on industry projects in year 4. The course has also built in a range of student support mechanisms in learning, language, mathematics and technical skills.

Course Objectives: The objectives of the course are to produce graduates who:

- have a solid foundation of scientific, engineering and project management knowledge;
- can develop creative and practical solutions to engineering problems;
- can communicate appropriately and effectively in different modes with different audiences;
- can work independently and collaboratively;
- can understand community needs in the context of societal aspirations and expectations;
- have both the skills and motivation to continue learning as professionals; and
- are work-ready and thus attractive to prospective employers.

Careers: Engineering technologists work in careers related to embedded systems, electronic circuit board design, factory automation, computer networking and power electronics in a wide range of industries including communication, transport, energy and entertainment.

Course Duration:3 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in a mathematics (any).

Admission Requirements International: Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in English language: - IELTS -an overall band score of 6+ or equivalent, subject to individual profile

Admission Requirements Mature Age: Mature Age applicant will be considered on the case by case basis. RPL may be granted for relevant experience gained in employment.

Admission Requirements VET: Applicant with relevant VET qualification may be granted up to 192 credit points of exemption.

COURSE STRUCTURE

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Year 1, Semester 1

ENF1101	ENGINEERING MATHEMATICS 1	12
ENF1102	ENGINEERING PHYSICS 1	12
ENF1103	ENGINEERING AND THE COMMUNITY	12
ENF1104	PROBLEM SOLVING FOR ENGINEERS	12

Year 1, Semester 2

ENF1201	ENGINEERING MATHEMATICS 2	12
ENF1202	ENGINEERING PHYSICS 2	12
ENF1204	INTRODUCTION TO ENGINEERING DESIGN	12
ENF1205	ENGINEERING FUNDAMENTALS	12

Year 2, Semester 1

ENE2102	DIGITAL & COMPUTER SYSTEMS	12
ENE2100	ENGINEERING DESIGN AND PRACTICE 2A	24
ENE2101	FUNDAMENTALS OF ELECTRICAL & ELECTRONIC CIRCUITS	12

Year 2, Semester 2

ENE2202	ELECTRONIC SYSTEMS	12
ENE2200	ENGINEERING DESIGN AND PRACTICE 2B	24
ENE2203	INDUSTRIAL CONTROL AND AUTOMATION	12

Year 3, Semester 1

ENE4101	ANALOG AND OPTOELECTRONICS	12
EES4100	OPERATING SYSTEMS AND NETWORK PROGRAMMING	12
VEB3101	ENGINEERING PROJECT 3A	12

BUSINESS/TECHNICAL ELECTIVE (12 Credit Points)

Year 3, Semester 2

ENE3202	EMBEDDED AND NETWORKED SYSTEMS	12
ENE3203	POWER ELECTRONICS AND MACHINES	12
VEB3102	ENGINEERING PROJECT 3B	12

BUSINESS/TECHNICAL ELECTIVE (12 credit points)

Business/Technical electives can be chosen from the College of Engineering and Science or from other Colleges within the university with approval from the course co-ordinator.

BACHELOR OF ENGINEERING (ELECTRICAL AND ELECTRONIC ENGINEERING)

Course Code:EBEE
Campus: Footscray Park.
This course is for Continuing students only.

About this course:A degree which explores the core areas of the discipline, and the opportunity to specialise in communication engineering, with embedded systems, microelectronic or power systems.

Course Objectives: The main objectives of the course are to: provide an integrated foundation for electrical disciplinary studies and course specialisation into the particular areas of Embedded Systems, Microelectronic Systems, Communication Systems and Power Systems Engineering; develop attitudes of personal initiative and enquiry in students that they may continue to further education and meet the technological changes in their profession; develop oral and written communications and an understanding of society and the engineer's role in society; provide for professional recognition by the Engineers Australia and other professional bodies.

Careers: Professional engineers in a wide range of industries, including communication, transport, energy and entertainment.

Course Duration:4 years

Admission Requirements Year 12:VCE units 3 and 4, with a study score of at least 20 in English (any), and in either Mathematical Methods or Specialist Mathematics.

COURSE STRUCTURE

Year 1

Semester 1

VEF1001	ENABLING SCIENCES 1A	12
VEF1003	ELECTRICAL FUNDAMENTALS 1A	12
VEB1100	ENGINEERING DESIGN AND PRACTICE 1A	24

Semester 2

VEF1002	ENABLING SCIENCES 1B	12
VEF1004	ELECTRICAL FUNDAMENTALS 1B	12
VEB1200	ENGINEERING DESIGN AND PRACTICE 1B	24

Year 2

Semester 1

VEF2001	LINEAR SYSTEMS AND MATHEMATICS 2A	12
VEF2003	SYSTEMS AND APPLICATIONS 2C	12
VEB2100	ENGINEERING DESIGN AND PRACTICE 2A	24

Semester 2

VEF2002	SYSTEMS AND MATHEMATICS 2B	12
VEF2004	SYSTEMS & APPLICATIONS 2D	12
VEB2200	ENGINEERING DESIGN AND PRACTICE 2B	24

Year 3

Semester 1

VEG3001	ANALOGUE ELECTRONICS A	6
VEH3003	EMBEDDED COMPUTER SYSTEMS DESIGN	6
VEA3001	INTRODUCTION TO CONTROL SYSTEMS A	6
VEB3100	ENGINEERING DESIGN AND PRACTICE 3A	24

Stream Specialisation Unit 1 (6 Credit Points)

Semester 2

VEP3001	PHOTONICS	6
VES3101	INTRODUCTION TO COMPUTER NETWORKS A	6
VEE3001	INTRODUCTION TO ELECTRICAL MACHINES	6
VEB3200	ENGINEERING DESIGN AND PRACTICE 3B	24

Stream Specialisation Unit 2 (6 Credit Points)

Year 4

Semester 1

VEB4100	ENGINEERING DESIGN 4A	12
VEG4101	PROFESSIONAL PRACTICE 4A	12

Stream Specialisation Unit 3 (6 Credit Points)

Stream Specialisation Unit 4 (6 Credit Points)

Electives 2 x 6 Credit Points

Semester 2

VEB4200	ENGINEERING DESIGN 4B	12
VEG4202	PROFESSIONAL PRACTICE 4B	12

Stream Specialisation Unit 5 (6 Credit Points)

Stream Specialisation Unit 6 (6 Credit Points)

Electives 2 x 6 Credit Points

Streams

Specialisation Stream Units (1-6) - Communication Systems Engineering

VET3100	ANALOG AND DIGITAL COMMUNICATIONS	6
VET3200	DIGITAL MODULATION AND CODING	6
VET4101	FIELD AND WAVES IN TELECOMMUNICATIONS	6
VEG4100	DIGITAL SIGNAL PROCESSING A	6
VET4202	DATA COMMUNICATIONS	6
VET4300	DIGITAL COMMUNICATIONS	6

Specialisation Stream Units (1-6) - Embedded Systems Engineering

VEH3001	DIGITAL SYSTEM DESIGN A	6
VEH3004	REAL TIME AND MULTITASKING COMPUTER SYSTEMS	6
VES3102	INTRODUCTION TO COMPUTER NETWORKS B	6
VES4101	COMPUTER SYSTEMS A	6
VEH4001	COMPUTER SYSTEMS ON AN ASIC	6
VEH3002	DIGITAL SYSTEM DESIGN B	6

Specialisation Stream Units (1-6) - Microelectronic Systems Engineering

VEM3001	CUSTOM IC DESIGN & EDA TOOLS	6
VEM3002	APPLICATION SPECIFIC IC DESIGN	6
VEM4001	ADVANCED CUSTOM IC DESIGN	6
VEM4012	DESIGN FOR TESTABILITY	6
VEM4002	HETEROGENEOUS SYSTEMS	6
VEM4100	ANALOG AND MIXED SIGNAL DESIGN	6

Specialisation Stream Units (1-6) - Power System Engineering

VEE3002	INTRODUCTION TO ELECTRICAL POWER SYSTEMS	6
VEE4500	POWER ELECTRONICS	6
VEE4200	ELECTRIC ENERGY SYSTEMS PROTECTION	6
VEE4100	ELECTRIC ENERGY SYSTEMS ANALYSIS AND OPERATION	6
VEE4700	POWER SYSTEM COMMUNICATION, MONITORING AND INSTRUMENTATION	6
VEE4400	HIGH VOLTAGE ENGINEERING	6

Elective Units

Students in a Specialisation Stream may choose elective units from the units in another Specialisation Stream subject to pre-requisites, from the electives listed below or from outside the College of Engineering and Science. Units from outside the College are subject to the approval of the Program Coordinator.

VEA3002	INTRODUCTION TO CONTROL SYSTEMS B	6
REP1000	DIRECTED STUDIES IN PHYSICS	12
REP4100	DATA ACQUISITION	12
REP4200	DIRECTED STUDIES IN PHYSICS 2	12
VEA4001	DISCRETE TIME CONTROL SYSTEMS A	6
VEA4200	FUZZY CONTROL AND APPLICATIONS	6
VEA4400	ROBOTICS AND AUTOMATION	6
VEB4006	DIRECTED STUDIES IN ELECTRICAL ENGINEERING 1	6
VEB4012	DIRECTED STUDIES IN ELECTRICAL ENGINEERING 2	12
VET4600	WIRELESS COMMUNICATIONS	6
VEE4800	ALTERNATIVE ENERGY SYSTEMS	6
VES4102	COMPUTER SYSTEMS B	6
VES4301	SOFTWARE ENGINEERING	6
VET4400	DIGITAL SIGNAL PROCESSING IN TELECOMMUNICATIONS 2	6

Note: Units elected outside the above list require approval of the Course Coordinator. Other Course Specific Notes Articulation Students successfully completing an Advanced Diploma in an appropriate subject will normally be granted 96 credit points exemption in the Bachelor of Electrical and Electronic Engineering. Students with other entry qualifications will be considered on an individual basis. Honours Requirements To be eligible for consideration for a degree with honours: (a) students will have achieved a minimum hour weighted average of 60% over year levels 1 to 3; (b) students would not have repeated a subject throughout year levels 1 to 3; (c) students will not have been granted more than one stage completion throughout the duration of the course; and (d) discretion to award honours grading that do not meet criteria above will rest with the Head of School. Eligibility for admission to a degree with honours will be determined at the end of year level 3 for students who are enrolled on a full time basis or, a part time basis or, who have transferred into the course with exemptions. Degrees with honours grading will be calculated using hour weighted averages. The level of awarded honours will be determined by the hour weighted average for year level 4. The following grading will apply: H1 First Class honours 80-100 H2A Second Class Honours Upper 70-79 H2B Second Class Honours Lower 60-69 P Pass 50-59 Industrial Experience Candidates applying for the award of Bachelor of Engineering Degree in Electrical and Electronic Engineering must ensure that they have submitted for approval, evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy Engineers Australia requirements. Professional Recognition Engineers Australia has granted full recognition for the Bachelor of Engineering in Electrical and Electronic Engineering. Recognition is a requirement for Graduate Membership of Engineers Australia and additionally for equivalent membership of many overseas engineering institutions. Overseas Exchange Program Victoria University has exchange agreements with Universities in many countries; some of which are the USA, Canada, Mexico, United Kingdom and many European and Asian countries. For those students who do wish to study abroad, there is the opportunity to experience living in a different culture and environment, and to develop self-responsibility and reliance skills. Many students achieve improved results in their remaining studies after returning home, having developed a clearer perception of their future career with a stronger determination to succeed.

BACHELOR OF ENGINEERING (MECHANICAL ENGINEERING)

Course Code:EBME
Campus: Footscray Park.
This course is for Continuing students only.

About this course: The degree is designed to provide the broad education required for a mechanical engineering career. In addition to theoretical and practical engineering content, the course contains integrated studies in economics, administration and communication. The degree emphasises achievement across mechanical engineering disciplines in concert with problem solving, design, engineering applications, innovation, resource management and professional responsibility. Government institutions and private enterprise employ mechanical engineers in manufacturing, design of products and machines, automatic control of machines and processes, heating and air conditioning systems, machine and condition monitoring, hydraulic and pneumatic systems, computer applications - including finite element analysis, computer-aided design and Computational Fluid Dynamics and research and development in a wide range of fields.

Course Objectives: The course is designed to provide an educational standard and vocational skills which will enable graduates to undertake professional practice in the discipline of Mechanical Engineering. Graduates are provided with a basis to progress through postgraduate studies, continuing education courses and participate in learned society endeavours.

Course Duration:4 years

Admission Requirements Year 12: The prerequisite subjects for admission into the first year of the course are based on entry at post Year 12, Victorian Certificate of Education, or equivalent level and are as follows. Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard to those listed above, should apply for admission in the normal manner. Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: IELTS - an overall band score of 6+, subject to individual profile; or TOEFL - a score of 550+, and a Test of Written English (TWE) score of 5+.

COURSE STRUCTURE

The course is offered over four years on a full-time basis. The entire course cannot be completed on a part-time basis. Students must complete 384 credit points.

Engineering subject codes commence with 'V'.

Science subject codes commence with 'R'.

Year 1

Semester One

RMA1001	ENGINEERING MATHEMATICS 1A	12
REP1001	ENGINEERING PHYSICS 1A	12
VAN1051	ENGINEERING PROFESSION	12
VAN1011	EXPERIMENTATION AND COMPUTING	12

Semester Two

RMA1002	ENGINEERING MATHEMATICS 1B	12
REP1003	ENGINEERING PHYSICS 1C	12
VAN1032	INTRODUCTION TO DESIGN	12
VAN1022	SOLID MECHANICS 1	12

Year 2

Semester One

VAM2011	COMPUTATIONS AND ENGINEERING ANALYSIS	12
VAN2021	SOLID MECHANICS 2	12
VAN2061	ENGINEERING MATERIALS	12
VAN2041	THERMOFLUIDS	12

Semester Two

VEM2012	ELECTRICAL ENGINEERING	12
VAM2062	MATERIALS AND MANUFACTURE	12
VAN2032	ENGINEERING DESIGN	12
VAM2042	THERMODYNAMICS AND FLUID MECHANICS 1	12

Year 3

Semester One

VAM3021	STRESS ANALYSIS 1	12

VAM3071	DYNAMICS	12
VAM3031	MECHANICAL ENGINEERING DESIGN 1	12
VAM3041	THERMODYNAMICS AND FLUID MECHANICS 2	12

Semester Two

VAM3012	SIGNAL ANALYSIS	12
VAM3022	STRESS ANALYSIS 2	12
VAM3072	MECHANICAL VIBRATIONS	12
VAN3052	ENGINEERING MANAGEMENT	12

Year 4

Semester One

VAM4021	COMPUTATIONAL MECHANICS	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12
VAN4011	ENGINEERING PROJECT 1	12
VAM4041	HEAT TRANSFER AND COMBUSTION	12

Year 4

Semester Two

VAM4032	MECHANICAL ENGINEERING DESIGN 2	12
VAN4012	ENGINEERING PROJECT 2	12
VAM4042	FLUID DYNAMICS	12

One Approved Elective

Elective Stream

VAM4062	MANUFACTURING AND POLYMER TECHNOLOGIES	12
VAM4092	TRANSPORTATION AND PACKAGING DYNAMICS	12
VAM4072	ADVANCED MECHANICS	12
VAM4082	AUTOMOTIVE ENGINES, ENERGY AND ENVIRONMENT	12

Other Course Specific Notes

Assessment in subjects is designed to monitor a student's progress and achievements as well as contribute to and enhance their learning. Normally a prescribed range of assessment methods is employed in any subject.

Assessment is by a combination of written assignments, tests, laboratory work and examinations.

Supplementary assessment is not normally available in any subject except at the discretion of the Head of School in exceptional circumstances.

Special Consideration in assessment may be granted on the grounds defined by the University Statutes.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual subject outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been made.

Degree with Honours

A Degree with Honours Program is offered concurrently with the fourth year of the ordinary Bachelor of Engineering program. Normally, students entering the final year of a full-time Bachelor of Engineering program (or its equivalent in part-time mode), will be offered honours candidacy, if they have achieved a minimum hour weighted average of 60 per cent over year levels 1 to 3, have not repeated a subject through levels 1 to 3 and have not been granted more than one stage completion throughout the duration of the course. Fourth year honours degree gradings will be determined by the relevant Examiners Board on the basis of the hour weighted average for year level 4.

Industrial Experience

Candidates applying for the award of a degree in mechanical engineering must ensure that they have submitted for approval evidence of having undertaken a minimum of 12 weeks industrial experience relevant to the course to satisfy the Institution of Engineers, Australia, requirements.

Overseas Exchange Program

Victoria University has exchange agreements with universities in many countries, some of which are the U.S.A., Canada, Mexico, United Kingdom and many European and Asian countries.

For those students who do wish to study abroad, there is the opportunity to experience living in a different culture and environment, and to develop self-responsibility and reliance skills. Many students achieve improved results in their remaining studies after returning home, having developed a clearer perception of their future career with a stronger determination to succeed.

Professional Recognition

Engineers Australia recognises the degree as meeting all academic requirements for corporate membership as a chartered engineer. Completion of the degree plus 12 weeks approved experience will admit to Graduate Membership. Victoria University students are eligible for Student Membership.

BACHELOR OF TECHNOLOGY (BUILDING SURVEYING)

Course Code:EBSB
Campus: Werribee, Footscray Park, Sunshine.

About this course: Building surveyors have expert knowledge of occupant safety, urban amenity, environmental sustainability and other considerations in the design and construction of buildings. They are responsible for statutory functions such as building permits, mandatory building inspections and issuing occupancy permits, and work with project architects, engineers and managers. This course provides a tertiary degree in Building Surveying with exit points at Diploma of Building

Surveying qualification level and Advanced Diploma of Building Surveying qualification level. The first three years of the course (at Newport and Footscray Park campus) focus on building technology and statutory control of building. This involves completion of twenty-four units of competency learning over two years leading to the Diploma of Building Surveying, followed by completion of an additional nineteen units of competency learning leading to the Advanced Diploma of Building Surveying. Concurrent studies provide students with basic professional literacy and numeracy. Subjects prescribed for this purpose are ENF1103 Engineering and the Community, JCM0112 Mathematics 1, JCM0113 Mathematics 2 and ENF1101 Engineering Mathematics 1. In the final (fourth) year of the course (spread over Footscray Park and Werribee campuses) the focus is on professional practice primarily in the areas of building design, building approval and building construction. Graduates of this course will have completed studies equivalent to the Graduate Certificate in Performance-Based Building and Fire Codes (Course Code: ETQB) at Werribee campus.

Course Objectives: Course objectives are to produce graduates who have acquired:

- The fundamentals in underlying areas of mathematics, physics, graphic communication, written communication, and health and safety;
- A strong technological base for professional practice in the area of Building Surveying;
- A sound knowledge of the policies and practices of Australian building regulatory systems;
- An understanding and appreciation of building design and approval, and building construction and inspection;
- A broad range of vocational skills that can be used to manage and operate a building surveying business, within either the private sector or public sector, in order to meet the needs of developers, practitioners, authorities, and other significant stakeholders;
- The specific skills that prepare students for employment in the fields of design consultancy, certification, approvals and permits, construction management, services installations inspection and maintenance, and facility management;
- An ability to work ethically and professionally either independently or in a team in the provision of building surveying services to clients and employers;
- An ability to adapt to the changing needs of industry, commerce and community.

Careers: Registered Building Surveyor The course provides the prescribed academic qualification for registration as a Building Surveyor, a Degree in Building Surveying from a University within the meaning of the Tertiary Education Act 1993. Upon completion of 3 years of practical experience to the satisfaction of the Building Practitioners Board of Victoria, Building Surveying Degree graduates are eligible to apply for registration as a Building Surveyor. Registered Building Inspector (Limited) Students who satisfactorily complete the twenty-four units of competency learning leading to the Diploma of Building Surveying accredited under the Victorian Qualifications Authority Act 2000 are eligible to apply for award of the Diploma. Upon completion of 2 years of practical experience to the satisfaction of the Board, Building Surveying Diploma graduates are eligible to apply for registration as a Building Inspector (Limited). Registered Building Inspector (Unlimited) Students who satisfactorily complete the nineteen units of competency learning leading to the Advanced Diploma of Building Surveying accredited under the Victorian Qualifications Authority Act 2000 are eligible to apply for award of the Advanced Diploma. Upon completion of 2 years of practical experience to the satisfaction of the Board, Building Surveying Advanced Diploma graduates are eligible to apply for registration as a Building Inspector (Unlimited).

Course Duration: 4 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English.

COURSE STRUCTURE

Four years full-time. Part-time enrolment may also be approved.

Year 1 and Year 2

Diploma of Building Surveying

BCGSV5001A	ASSESS THE CONSTRUCTION OF DOMESTIC SCALE BUILDINGS	100
BCGSV5002A	EVALUATE MATERIALS FOR CONSTRUCTION OF DOMESTIC SCALE BUILDINGS	72
BCGSV5003A	PRODUCE WORKING DRAWINGS FOR RESIDENTIAL BUILDINGS	90
BCGSV5004A	APPLY LEGISLATION TO URBAN DEVELOPMENT AND BUILDING CONTROLS	36
BCGSV5005A	APPLY FOOTING AND GEOMECHANICAL DESIGN PRINCIPLES FOR DOMESTIC SCALE BUILDINGS	36
BCGSV5006A	ASSESS CONSTRUCTION FAULTS IN RESIDENTIAL BUILDINGS	36
BCGSV5007A	UNDERTAKE SITE SURVEYS AND SET OUT PROCEDURES TO BUILDING PROJECTS	72
BCGSV5008A	APPLY BUILDING CONTROL LEGISLATION TO BUILDING SURVEYING	36
BCGSV5009A	ASSESS THE IMPACT OF FIRE ON BUILDING MATERIALS	36
BCGSV5010A	INTERACT WITH CLIENTS IN A REGULATED ENVIRONMENT	36
BCGSV5011A	APPLY BUILDING CODES AND STANDARDS TO RESIDENTIAL BUILDINGS	36
BCGSV5012A	ASSESS TIMBER FRAMED DESIGNS FOR ONE AND TWO STOREY BUILDINGS	36
BCGSV5013A	APPLY PRINCIPLES OF ENERGY EFFICIENT DESIGN TO BUILDINGS	36
BCGSV5014A	APPLY BUILDING SURVEYING PROCEDURES TO RESIDENTIAL BUILDINGS	36
BCGSV5015A	ASSESS STRUCTURAL REQUIREMENTS FOR DOMESTIC	72

	SCALE BUILDINGS	
BSBADM506A	MANAGE BUSINESS DOCUMENT DESIGN AND DEVELOPMENT	80
BSBCMN406A	MAINTAIN BUSINESS TECHNOLOGY	40
CHCCOM3A	UTILISE SPECIALIST COMMUNICATION SKILLS	50
CHCCOM4A	DEVELOP, IMPLEMENT & PROMOTE EFFECTIVE COMMUNICATION TECHNIQUES	75
ICAITU128A	OPERATE A PERSONAL COMPUTER	30
ICAITU129A	OPERATE A WORD PROCESSING APPLICATION	30
ICAITU130A	OPERATE A SPREADSHEET APPLICATION	30
ICAITU131A	OPERATE A DATABASE APPLICATION	30
ICAITU133A	SEND AND RETRIEVE INFORMATION OVER THE INTERNET USING BROWSERS AND EMAIL	25

Subtotal for Diploma: Total Hours 1136

plus Higher Education/Foundation Studies

ENF1103	ENGINEERING AND THE COMMUNITY	12
JCM0112	MATHEMATICS 1	12
JCM0113	MATHEMATICS 2	12

Total for Years 1 and 2: Total Credit Points 36 Total Hours 1268

Year 3

Advanced Diploma of Building Surveying

BCGSV6001A	ASSESS THE CONSTRUCTION OF BUILDINGS UP TO 3 STOREYS	72
BCGSV6002A	PRODUCE WORKING DRAWINGS FOR BUILDINGS UP TO 3 STOREYS	40
BCGSV6003A	ASSESS CONSTRUCTION FAULTS IN BUILDINGS UP TO 3 STOREYS	40
BCGSV6004A	APPLY FOOTINGS AND GEOMECHANICAL DESIGN PRINCIPLES TO BUILDINGS UP TO 3 STOREYS	40
BCGSV6005A	EVALUATE SERVICES LAYOUT AND CONNECTION METHODS FOR RESIDENTIAL AND COMMERCIAL BUILDINGS UP TO 3 STOREYS	40
BCGSV6006A	EVALUATE THE USE OF CONCRETE FOR RESIDENTIAL AND COMMERCIAL BUILDINGS UP TO 3 STOREYS	40
BCGSV6007A	ASSESS STRUCTURAL REQUIREMENTS FOR BUILDINGS UP TO 3 STOREYS	40
BCGSV6008A	APPLY BUILDING CODES AND STANDARDS TO BUILDINGS UP TO 3 STOREYS	72
BCGSV6009A	IMPLEMENT PERFORMANCE BASED CODES AND RISK MANAGEMENT PRINCIPLES FOR BUILDINGS UP TO 3 STOREYS	72
BCGSV6010A	APPLY FIRE TECHNOLOGY TO BUILDINGS UP TO 3 STOREYS	40
BCGSV6011A	APPLY LEGAL PROCEDURES TO BUILDING SURVEYING	40
BCGSV6012A	FACILITATE COMMUNITY DEVELOPMENT CONSULTATION	40
BCGSV6013A	CO-ORDINATE ASSET REFURBISHMENT	72
BCGSV6014A	MANAGE AND PLAN LAND USE	40
BCGSV6015A	ANALYSE AND PRESENT BUILDING SURVEYING RESEARCH INFORMATION	90
BCGSV6016A	APPLY BUILDING SURVEYING PROCEDURES TO BUILDINGS UP TO 3 STOREYS	90
BSX154L606	MANAGE HUMAN RESOURCES	40
LGAPLEM502A	APPLY ECOLOGICALLY SUSTAINABLE DEVELOPMENT PRINCIPLES TO THE BUILT ENVIRONMENT	60
LMFFT4010A	IDENTIFY AND CALCULATE PRODUCTION COSTS	36

Subtotal for Advanced Diploma: Total Hours 1004

plus Higher Education

ENF1101	ENGINEERING MATHEMATICS 1	12

Total for Year 3: Total Credit Points 12 Total Hours 1064

Year 4

Includes units as prescribed for Graduate Certificate in Performance-Based Building and Fire Codes

Semester 1

VQB5611	RISK ASSESSMENT AND HUMAN BEHAVIOUR	12
VQB5621	FIRE GROWTH, DETECTION AND EXTINGUISHMENT	12
VAN4011	ENGINEERING PROJECT 1	12
VAN4051	ENGINEERING PROJECT MANAGEMENT	12

Subtotal for Semester One: Total Credit Points 48

Semester Two

VQB5632	SMOKE AND FIRE SPREAD, FIRE SAFETY SYSTEM DESIGN	12

VQB5642	PERFORMANCE CODES METHODOLOGY AND STRUCTURE	12
VAN4012	ENGINEERING PROJECT 2	12
VAN3052	ENGINEERING MANAGEMENT	12

Subtotal for Semester Two: Total Credit Points 48

Other Course Specific Notes For the competency learning components of the course, assessment is conducted in accordance with the Assessment Guidelines for the Building and Construction Industry. For the other units that make up the degree, the various assessment stipulations specific to individual units are as set out in Unit Details in the College of Engineering and Science Handbook. Professional Recognition The Degree is recognized by the Building Practitioners Board of Victoria in the event of graduates applying for registration as a Building Surveyor. The Board also recognizes the Diploma and Advanced Diploma courses which are accredited under the Victorian Qualifications Authority Act 2000 for the purposes of registration as a Building Inspector (Limited) or Building Inspector (Unlimited) respectively.

BACHELOR OF ENGINEERING SCIENCE (SPORTS ENGINEERING)

Course Code:EBSG
Campus: Footscray Park.

About this course: The course covers practical and supporting engineering skills necessary for a career in a variety of key industries and organisations connected with engineering sports related technologies. These industries include equipment and sports gear manufacturers, professional sports associations and clubs, sports institutes, sport infrastructure designers and elite sports research. Graduates can work as design engineers, test engineers and software engineers. The initial part of the course is structured to provide a solid foundation in mathematics, physics, engineering sciences and human movement. The intermediate semesters include studies in specific topics of engineering materials, electrical engineering; mechanical engineering, biomechanics and ergonomics design. Students complete the course with studies in mechatronics and dynamics, management and professional practice, computer applications as well as a major project which will normally involve working with an industry partner. Work experience opportunities are available for selected students.

Course Objectives: To graduate highly skilled engineering technologists capable of crossing and blending traditional discipline boundaries and who will be able to provide knowledge-based practical engineering services to the sports, sports science, and exercise and rehabilitation industries. To produce graduates who are universally recognised as leading practitioners in their field and who, as Sports Engineers, are capable of making a contribution to society and the community. To raise the University's profile in the community and industry by becoming the leading provider of Sports Engineering education and research in Australia.

Careers: The program will produce graduates with an appropriate breadth and depth of capability that will enable them to actively contribute to or lead multidisciplinary teams with interests in sports-related application or research. Graduates will be highly skilled engineering technologists capable of crossing and blending traditional engineering and human movement science discipline boundaries and who will be able to provide knowledge-based practical engineering services to the sports, sports science, and exercise and rehabilitation industries. Graduates find employment with: sports equipment designers and vehicle manufacturers, elite sports associations and clubs, sport research and development organisations. Employment opportunities may exist with automotive, transport, electronics and embedded systems industries.

Course Duration:3 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in a mathematics (any).

Admission Requirements International: Achieved an IELTS (Academic Module) result with an overall score of 6 (no band less than 6) or equivalent. Completed a secondary school qualification equivalent to Australia¿s year 12 or VCE qualification. Provide evidence of prior study of mathematics equivalent to Australia's year 12 level. Physics is optional but highly recommended.

Admission Requirements Mature Age: Basic academic degree or work experience background in (any) fields of engineering or sports science. Applications will be treated on an individual basis.

COURSE STRUCTURE

Major field of studies: Physiology, Biomechanics, Dynamics, Fluid mechanics and thermodynamics, Digital and analogue electronics, Mechatronics, sensors and data acquisition, Materials, Engineering design, Computing, Management and professional practice.

Year 1, Semester 1

ENF1101	ENGINEERING MATHEMATICS 1	12
ENF1102	ENGINEERING PHYSICS 1	12
VES1001	INTRODUCTION TO SPORTS ENGINEERING	12
RBM1174	HUMAN PHYSIOLOGY	12

Year 1, Semester 2

ENF1201	ENGINEERING MATHEMATICS 2	12
ENF1202	ENGINEERING PHYSICS 2	12
ENF1204	INTRODUCTION TO ENGINEERING DESIGN	12
ENF1205	ENGINEERING FUNDAMENTALS	12

Year 2, Semester 1

VAM2121	MECHANICS OF ENGINEERING MATERIALS	12
ENE2101	FUNDAMENTALS OF ELECTRICAL & ELECTRONIC CIRCUITS	12
ENE2102	DIGITAL & COMPUTER SYSTEMS	12
VAN2041	THERMOFLUIDS	12

Year 2, Semester 2

ENE2202	ELECTRONIC SYSTEMS	12
AHE1202	BIOMECHANICS	12

VES2201	DESIGN & ERGONOMICS	12
AHE2104	EXERCISE PHYSIOLOGY	12

Year 3, Semester 1

VES3111	MECHATRONICS & SENSORS 1	12
VES3141	SPORTS DYNAMICS	12
VES3131	COMPUTER AIDED ENGINEERING DESIGN	12
VES3121	SPORTS MATERIALS	12

Year 3, Semester 2

VES3202	MECHATRONICS & SENSORS 2	12
VES3232	SPORTS ENGINEERING MANAGEMENT	12
VES3212	SPORTS ENGINEERING PROJECT	12
AHE2102	SPORTS BIOMECHANICS	12

GRADUATE DIPLOMA IN PROJECT MANAGEMENT

Course Code: EGPR
Campus: Footscray Park.

Course Objectives: To provide students with a conceptual understanding of relevant models, modes of analysis and techniques for understanding and procurement. They will also have developed the ability to apply and carrying out project management, contract management and evaluate these models, modes of analysis and technique in the context of the legal, ethical and accountability requirements which apply. In addition to the technical skills provided in the course, graduates will have developed strong relevant professional skills as well as strong personal, interpersonal and organisational attributes. By utilising a consultative committee of current project management professionals, the course has been designed to meet the needs of project managers in industry, equip professionals already in industry with advanced principles and techniques to enable them to assume the role of project manager and/or become an effective member of project management teams and adopt a unique approach to manage people, resources, time line and risks to achieve a successful project outcome.

Careers: This course is designed to equip professionals with advanced project management principles and techniques, enabling graduates to assume the role of project manager and/or become effective members of project management teams.

Course Duration: 1 year

Admission Requirements Other: A Degree or a Diploma in any discipline and a minimum of 2 years post-qualification experience. The requirement of qualification may be waived in exceptional circumstance on the basis of experience.

COURSE STRUCTURE

1 year (full time) or Maximum three years (part time)

Year 1, Semester 1

Course structure consists of four project management core units plus four college based elective units.

Project Management Core Units

VPP5600	PRINCIPLES OF PROJECT MANAGEMENT	12
VPP5640	PROJECT GOVERNANCE	12

College of Business stream

BMO6624	ORGANISATION CHANGE MANAGEMENT	12
BMO5602	BUSINESS PROJECT MANAGEMENT	12

College of Arts stream

BAO5505	ACCOUNTING FOR EVENTS	12
VCP5705	PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY	12

College of Engineering and Science stream

VPP5621	PROJECT RISK MANAGEMENT	12
VCP5726	PROJECT PROCUREMENT MANAGEMENT	12

Year 1, Semester 2

Project Management Core Units

AHB5205	PROJECT MANAGEMENT AND PEOPLE	12
VPP5610	PROJECT PLANNING AND CONTROL	12

College of Business Stream

BHO6505	MARKETING MANAGEMENT	12
BMO6622	MANAGING INNOVATION AND ENTREPRENEURSHIP	12

College of Arts Stream

AHB5202	SPORT EVENT MANAGEMENT	12
VCP5736	FACILITY LIFE CYCLE COSTING	12

College of Engineering and Science Stream

VPP5620	PROJECT STAKEHOLDERS MANAGEMENT	12
VPP5716	PROJECT DEVELOPMENT ANALYSIS AND REVIEW	12

Students who successfully complete eight required units are eligible to graduate with a Graduate Diploma in Project Management. Students who are enrolled in the Master of Project Management course are not eligible to apply but may exit with a Graduate Diploma in Project Management.

GRADUATE DIPLOMA IN BUILDING FIRE SAFETY AND RISK ENGINEERING

Course Code: EGQB
Campus: Werribee.

About this course: The course aims to produce professionals who are familiar with fire science and technology fundamentals, who can apply rational engineering principles and techniques to demonstrate cost-effective fire safety system designs for buildings, and will be familiar with the content and application of fire engineering design codes.

Course Objectives: The course provides opportunities for professional people to: develop advanced technical knowledge and skills in the specialist discipline of fire science and technology and apply to a range of building and structural settings understand and apply legislation and fire safety engineering design codes as a team member develop the ability to plan, co-ordinate, complete and evaluate complex projects, taking into consideration social, economic, cultural and environmental impacts apply the techniques and advanced modelling tools to analyse effectiveness of proposed fire safety design solutions reflect how engineers apply rational engineering principles and techniques to identify cost-effective fire safety system designs adopt sound research methodologies in the independent investigation of building and occupant characteristics and associated hazards communicate verbally and in writing utilising a range of professional formats to a variety of associates including peers, professional and industry representatives and community members demonstrate critical reflection of own learning goals and strategies in relation to career advancement.

Careers: It is expected that graduates of the Graduate Diploma in Building Fire Safety and Risk Engineering (EGQB) will be able to design and analyse performance based fire safety engineering solutions for buildings. They may receive following certifications from various state statutory bodies:

- Fire Safety Professional in Queensland.
- Registered Building Practitioner (Fire Safety Engineer) in Victoria if they previously have bachelor degrees in engineering. Prospective students are requested to check with their state statutory bodies (such as Building Practitioners Board in Victoria) for any additional requirement.

Alternatively the EGQB is a pathway to further study and research through EMQB Master of Engineering (Building Fire Safety and Risk Engineering) and PhD.

Course Duration:1 year

Admission Requirements Mature Age: To qualify for admission to the course an applicant must have successfully completed a degree in engineering or a four-year degree or equivalent in science or building surveying.Provision will be made to enrol a limited number of students in the course upon completion of Graduate Certificate in Performance -Based Building if they do not meet the admission requirement.All applicants must either have previously studied, or demonstrated a sound basic knowledge of the following topics: fluid dynamics, heat transfer, differential calculus, properties of materials and structural behaviour. Bridging units (VQB5781 MATHEMATICS FOR FIRE SAFETY ENGINEERS and VQB5791 MECHANICS OF THERMO-FLUIDS AND SOLIDS FOR FIRE SAFETY ENGINEERS or equivalent from other universities) are suggested to overcome any gap.

COURSE STRUCTURE

This course is equivalent to one year and is offered on a part-time basis, in block modules over a period of two years. Students must complete 96 credit points. The course is comprised of six units of 12 credit points and one unit of 24 credit points, as illustrated below. The 24 credit point unit is a capstone unit. For students wishing to obtain this qualification the following is recommended:

- For students who have an engineering or science degree it is suggested that they enrol in the Masters in Building Fire Safety and Risk Engineering course. On completion of the first four units: VQB5611, VQB5612, VQB5641 and VQB5642 students will be able to exit and be awarded Graduate Certificate in Performance-Based Building and Fire Codes. If students complete a further three units: VQB5751, VQB5761 and VQB5781, they will be able to exit with a Graduate Diploma in Building Fire Safety and Risk Engineering qualification. The students will be awarded a Masters upon completion of all the required units.
- For students who do not have an engineering or science degree, but meet the admission requirements of the Graduate Certificate are required to enrol directly into the Graduate Certificate. Should students find that they wish to continue with studies in this field they may then enrol in the Masters. However, these students will have the option of exiting with a Graduate Diploma if they only complete requisite Graduate Diploma units.
- Students without an engineering or science degree and advanced knowledge in mathematics and physics will be given the option of undertaking specialised units in advanced mathematics and physics (VQB5781 MATHEMATICS FOR FIRE SAFETY ENGINEERS and VQB5791 MECHANICS OF THERMO-FLUIDS AND SOLIDS FOR FIRE SAFETY ENGINEERS) before taking the last three core units of the Graduate Diploma.

Year 1

VQB5611	RISK ASSESSMENT AND HUMAN BEHAVIOUR	12
VQB5612	SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALS	12
VQB5641	FIRE SAFETY SYSTEMS DESIGN	12
VQB5642	PERFORMANCE CODES METHODOLOGY AND STRUCTURE	12

Year 2

VQB5751	FIRE TECHNOLOGY MODELLING	12
VQB5761	FIRE SAFETY SYSTEMS MODELLING	12
VQB5771	FIRE SAFETY ENGINEERING APPLICATION	24

Assessment

Assessments will be conducted through a combination of assignments and an examination. Distribution of marks among each aspect of assessment is determined individually for each unit.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual unit outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been met.

MASTER OF PROJECT MANAGEMENT

Course Code:EMPR
Campus: Footscray Park.

Course Objectives: To provide students with a conceptual understanding of relevant models, modes of analysis and techniques for understanding and procurement. They will also have developed the ability to apply and carrying out project management, contract management and evaluate these models, modes of analysis and technique in the context of the legal, ethical and accountability requirements which apply. In addition to the technical skills provided in the course, graduates will have developed strong relevant professional skills as well as strong personal, interpersonal and organisational attributes. By utilising a consultative committee of current project management professionals, the course has been designed to meet the needs of project managers in industry, equip professionals already in industry with advanced principles and techniques to enable them to assume the role of project manager and/or become an effective member of project management teams and adopt a unique approach to manage people, resources, time line and risks to achieve a successful project outcome.

Careers: This course is designed to equip professionals with advanced project management principles and techniques, enabling graduates to assume the role of project manager and/or become effective members of project management teams.

Course Duration:1.5 years

Admission Requirements Other:A Degree or a Diploma in any discipline and a minimum of 2 years post-qualification experience. The requirement of qualification may be waived in exceptional circumstance on the basis of experience.

COURSE STRUCTURE

1.5 years (full time) or maximum four years (part time).

Year 1, Semester 1

Course structure consists of five project management core units plus four course based elective units plus one faculty based elective unit and project management specific topic (project work).

Project Management Core Units

VPP5600	PRINCIPLES OF PROJECT MANAGEMENT	12
BMO6630	BUSINESS RESEARCH METHODS	12
VPP5640	PROJECT GOVERNANCE	12

College of Business stream

BMO5602	BUSINESS PROJECT MANAGEMENT	12
BMO6624	ORGANISATION CHANGE MANAGEMENT	12

College of Arts stream

BAO5505	ACCOUNTING FOR EVENTS	12
VCP5705	PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY	12

College of Engineering and Science stream

VPP5621	PROJECT RISK MANAGEMENT	12
VCP5726	PROJECT PROCUREMENT MANAGEMENT	12

Other Common Units

VPP8050	PROJECT MANAGEMENT SPECIFIC TOPIC (PROJECT WORK - 12CP)	12
VPP8060	PROJECT MANAGEMENT SPECIFIC TOPIC (PROJECT WORK - 24CP)	24

Year 1, Semester 2

Project Management Core Units

AHB5205	PROJECT MANAGEMENT AND PEOPLE	12
VPP5610	PROJECT PLANNING AND CONTROL	12

College of Business Stream

BHO6505	MARKETING MANAGEMENT	12
BMO6622	MANAGING INNOVATION AND ENTREPRENEURSHIP	12

College of Arts Stream

AHB5202	SPORT EVENT MANAGEMENT	12
VCP5736	FACILITY LIFE CYCLE COSTING	12

College of Engineering and Science Stream

VPP5620	PROJECT STAKEHOLDERS MANAGEMENT	12
VPP5716	PROJECT DEVELOPMENT ANALYSIS AND REVIEW	12

Other Common Units

VPP8050	PROJECT MANAGEMENT SPECIFIC TOPIC (PROJECT WORK - 12CP)	12
VPP8060	PROJECT MANAGEMENT SPECIFIC TOPIC (PROJECT WORK - 24CP)	24

Students who successfully complete 10 required units with honours will be eligible to complete a project work (2 units) and obtain the Master of Project Management degree.

MASTER OF ENGINEERING (BUILDING FIRE SAFETY AND RISK ENGINEERING)

Course Code:EMQB
Campus: Werribee.

About this course: The course provides opportunities for professional people to develop advanced technical skills in fire safety engineering discipline; develop their understanding of legislation and management relevant to this discipline; develop ability to plan, co-ordinate and apply rational engineering principles and techniques to demonstrate cost-effective fire safety system designs for buildings; apply and extend research and reporting skills and gain specialist knowledge of a topic relevant to fire safety.

Course Objectives: The course provides opportunities for professional people to develop advanced technical knowledge and skills in the specialist discipline of fire science and technology and apply to a range of building and structural settings understand and apply legislation and fire safety engineering design codes as a team member develop the ability to plan, co-ordinate, complete and evaluate complex projects, taking into consideration social, economic, cultural and environmental impacts apply the techniques and advanced modelling tools to analyse effectiveness of proposed fire safety design solutions reflect how engineers apply rational engineering principles and techniques to identify cost-effective fire safety system designs adopt sound research methodologies in the independent investigation of building and occupant characteristics and associated hazards communicate verbally and in writing utilising a range of professional formats to a variety of associates including peers, professional and industry representatives and community members apply the skills learnt within the course to a realistic research project gain industry experience demonstrate critical reflection of own learning goals and strategies in relation to career advancement

Careers: It is expected that graduates of the Masters in Building Fire Safety and Risk Engineering (EGQB) will be able to design and analyse performance based fire safety engineering solutions for buildings and gain specialist knowledge of a topic relevant to fire safety. They may receive following certifications from various state statutory bodies: Fire Safety Professional in Queensland. Registered Building Practitioner (Fire Safety Engineer) in Victoria if they previously have bachelor degrees in engineering. Prospective students are requested to check with their state statutory bodies (such as Building Practitioners Board in Victoria) for any additional requirement. Alternatively EMQB is a pathway to further study and research through Masters by Research or/and PhD.

Course Duration: 2 years

Admission Requirements International: To qualify for admission to the course applicants are expected to have a four-years degree in engineering or a three-years degree in science plus two years relevant work experience.

Admission Requirements Mature Age: To qualify for admission to the course applicants are expected to have completed a Graduate Certificate in Performance-Based Building in Fire Codes with honours average or a four-years degree in engineering or a three-years degree in science plus two years relevant work experience

COURSE STRUCTURE

The course is offered over three years on a part-time basis (may be extended to four years) or 18-24 months on a full-time basis. The total credit points for the course are 192 points comprised of nine core units (8x12 credit points plus 1x24), and an Industrial Experience unit (24 credit points), and a minor thesis (48 credit points).

Year 1, Semester 1

VQB5611	RISK ASSESSMENT AND HUMAN BEHAVIOUR	12
VQB5612	SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALS	12

Year 1, Semester 2

VQB5641	FIRE SAFETY SYSTEMS DESIGN	12
VQB5642	PERFORMANCE CODES METHODOLOGY AND STRUCTURE	12

Students can exit with Graduate Certificate (ETQB) if the above units are completed.

VQB5773	INDUSTRIAL EXPERIENCE ON FIRE SAFETY	24

Summer Units

VQB5781	MATHEMATICS FOR FIRE SAFETY ENGINEERS	12
VQB5791	MECHANICS OF THERMO-FLUIDS AND SOLIDS FOR FIRE SAFETY ENGINEERS	12

Students who have an engineering or science degree may receive recognition of prior learning (RPL) for VQB5781 and VQB5791.

Year 2, Semester 1

VQB5751	FIRE TECHNOLOGY MODELLING	12
VQB5761	FIRE SAFETY SYSTEMS MODELLING	12

The following is available for full time students across semesters 1 & 2

VQT6061	BUILDING FIRE RESEARCH A	24

Year 2, Semester 2

VQB5771	FIRE SAFETY ENGINEERING APPLICATION	24

Students can exit with Graduate Diploma (EGQB) if units VQB5611, VQB5612, VQB5641, VQB5642, VQB5751, VQB5761 and VQB5771 are completed.

VQT6062	BUILDING FIRE RESEARCH B	24

DOCTOR OF PHILOSOPHY

Course Code: EPHC, EPLC (LOCAL STUDENTS)
Campus: Various, dependent on the research field. EPHC Off-campus site code (ZA).. This course is for Continuing students only.

About this course: The Doctor of Philosophy (PhD) is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university processes. Students may include some coursework studies during their candidature as recommended by the university. Academic staff, with suitable qualifications and proven research skills, supervise students in various research fields across health, engineering and science.

Course Objectives:-

Course Duration: 3 years

Admission Requirements Year 12: Applicants should normally have completed either a Masters degree or a four year undergraduate degree with Honours or its equivalent at a high standard.

COURSE STRUCTURE

The course normally requires three years of full-time study or part-time equivalent.

Civil and Building Stream

Course Code EPHC

VCC8001	RESEARCH THESIS FULL TIME	48
VCC8002	RESEARCH THESIS FULL TIME	48
VCC8011	RESEARCH THESIS (PART-TIME)	24
VCC8012	RESEARCH THESIS (PART TIME)	24

Mechanical Stream Course Code: EPHC

VMR8001	RESEARCH THESIS 1 FULL TIME	48
VMR8002	RESEARCH THESIS 2 FULL TIME	48
VMR8011	RESEARCH THESIS 1 PART TIME	24
VMR8012	RESEARCH THESIS 2 PART TIME	24

Australian Food Marketing Centre

Course Code: EPHC

REM8001	RESEARCH THESIS 1 FULL TIME	48
REM8002	RESEARCH THESIS 2 FULL TIME	48
REM8011	RESEARCH THESIS 1 PART TIME	24
REM8012	RESEARCH THESIS 2 PART TIME	24

College of Health and Biomedicine

Biomedical Sciences Stream

Course Code: EPHC

RBM8001	RESEARCH THESIS 1 FULL TIME	48
RBM8002	RESEARCH THESIS 2 FULL TIME	48
RBM8011	RESEARCH THESIS 1 PART TIME	24
RBM8012	RESEARCH THESIS 2 PART TIME	24

Health Sciences Stream

Course Code: EPHC or EPLC

HHM6800	RESEARCH THESIS (FULL-TIME)	48
HHM6801	RESEARCH THESIS (PART-TIME)	24

College of Engineering and Science

Course Code: EPLC

RCM8001	RESEARCH THESIS 1 FULL TIME	48
RCM8002	RESEARCH THESIS 2 FULL TIME	48
RCM8011	RESEARCH THESIS 1 PART TIME	24
RCM8012	RESEARCH THESIS 2 PART TIME	24

Centre for Environmental Safety and Risk Engineering

Course Code: EPLC

VQT8001	RESEARCH THESIS 1 FULL TIME	48
VQT8002	RESEARCH THESIS 2 FULL TIME	48
VQT8011	RESEARCH THESIS 1 PART TIME	24
VQT8012	RESEARCH THESIS 2 PART TIME	24

College of Engineering and Science

Electrical Engineering Stream

Course Code: EPHC

VEE8001	RESEARCH THESIS 1 FULL TIME	48
VEE8002	RESEARCH THESIS 2 FULL TIME	48
VEE8011	RESEARCH THESIS 1 PART TIME	24
VEE8012	RESEARCH THESIS 2 PART TIME	24

Physics Stream

Course Code: EPHC

RPH8001	RESEARCH THESIS 1 FULL TIME	48
RPH8002	RESEARCH THESIS 2 FULL TIME	48
RPH8011	RESEARCH THESIS 1 PART TIME	24
RPH8012	RESEARCH THESIS 2 PART TIME	24

College of Health and Biomedicine

Course Code: EPHC

RBT8001	RESEARCH THESIS 1 FULL TIME	48
RBT8002	RESEARCH THESIS - SEM 2 (FULL-TIME)	48
RBT8011	RESEARCH THESIS 1 PART TIME	24
RBT8012	RESEARCH THESIS - SEM 2 (PART-TIME)	24

Food Science Stream

Course Code: EPHC

RBF8001	RESEARCH THESIS 1 FULL TIME	48
RBF8002	RESEARCH THESIS 2 FULL TIME	48
RBF8011	RESEARCH THESIS 1 PART TIME	24
RBF8012	RESEARCH THESIS 2 PART TIME	24

Chemical Sciences Stream

Course Code: EPHC

RCS8001	RESEARCH THESIS 1 FULL TIME	48
RCS8002	RESEARCH THESIS 2 FULL TIME	48
RCS8011	RESEARCH THESIS 1 PART TIME	24
RCS8012	RESEARCH THESIS 2 PART TIME	24

College of Health and Biomedicine

Course Code: EPHC or EPLC

HNM6800	RESEARCH THESIS (FULL-TIME)	48
HNM6801	RESEARCH THESIS (PART-TIME)	24

Packaging and Polymer Unit

Course Code: EPHC

VPP8001	RESEARCH THESIS 1 FULL TIME	48
VPP8002	RESEARCH THESIS 2 FULL TIME	48
VPP8011	RESEARCH THESIS 1 PART TIME	24
VPP8012	RESEARCH THESIS 2 PART TIME	24

Transportation Stream

Course Code: EPHC

VPT8001	RESEARCH THESIS 1 FULL TIME	48
VPT8002	RESEARCH THESIS 2 FULL TIME	48
VPT8011	RESEARCH THESIS 1 PART TIME	24
VPT8012	RESEARCH THESIS 2 PART TIME	24

MASTER OF ENGINEERING (BY RESEARCH)

Course Code:ERIT
Campus: Werribee, Footscray Park, ERIT Off-campus site code: ZA.

About this course: This Course is designed to enhance the students' range of knowledge in various research fields in engineering and to enable a focusing of practical skills into the specific research area. It is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university processes.

Course Objectives:-

Careers: PhD, research assistant, research technician.

Course Duration:2 years

Admission Requirements International: An IELTS (Academic Module) result with an overall score of 6.5 (no band less than 6) or equivalent and a four year bachelor degree in Engineering, Building Surveying, Computer Science, Physics or Chemistry or an equivalent combination of qualifications and experience.

Admission Requirements Other:A four year bachelor degree in Engineering, Building Surveying, Computer Science, Physics or Chemistry or an equivalent combination of qualifications and experience.

COURSE STRUCTURE

This is a 192 credit point course.

FULL TIME

SCHOOL OF ENGINEERING AND SCIENCE

Civil & Building Engineering stream

Year 1, Semester 1

VCC8001	RESEARCH THESIS FULL TIME	48

Year 1, Semester 2

VCC8002	RESEARCH THESIS FULL TIME	48

Year 2, Semester 1

VCC8001	RESEARCH THESIS FULL TIME	48

Year 2, Semester 2

VCC8002	RESEARCH THESIS FULL TIME	48

Electrical Engineering stream

Year 1, Semester 1

VEE8001	RESEARCH THESIS 1 FULL TIME	48

Year 1, Semester 2

VEE8002	RESEARCH THESIS 2 FULL TIME	48

Year 2, Semester 1

VEE8001	RESEARCH THESIS 1 FULL TIME	48

Year 2, Semester 2

VEE8002	RESEARCH THESIS 2 FULL TIME	48

Mechanical Engineering stream

Year 1, Semester 1

VMR8001	RESEARCH THESIS 1 FULL TIME	48

Year 1, Semester 2

VMR8002	RESEARCH THESIS 2 FULL TIME	48

Year 2, Semester 1

VMR8001	RESEARCH THESIS 1 FULL TIME	48

Year 2, Semester 2

VMR8002	RESEARCH THESIS 2 FULL TIME	48

Packaging Stream

Year 1, Semester 1

VPP8001	RESEARCH THESIS 1 FULL TIME	48

Year 1, Semester 2

VPP8002	RESEARCH THESIS 2 FULL TIME	48

Year 2, Semester 1

VPP8001	RESEARCH THESIS 1 FULL TIME	48

Year 2, Semester 2

VPP8002	RESEARCH THESIS 2 FULL TIME	48

Transportation stream

Year 1, Semester 1

VPT8001	RESEARCH THESIS 1 FULL TIME	48

Year 1, Semester 2

VPT8002	RESEARCH THESIS 2 FULL TIME	48

Year 2, Semester 1

VPT8001	RESEARCH THESIS 1 FULL TIME	48

Year 2, Semester 2

VPT8002	RESEARCH THESIS 2 FULL TIME	48

Physics stream

Year 1, Semester 1

RPH8001	RESEARCH THESIS 1 FULL TIME	48

Year 1, Semester 2

RPH8002	RESEARCH THESIS 2 FULL TIME	48

Year 2, Semester 1

RPH8001	RESEARCH THESIS 1 FULL TIME	48

Year 2, Semester 2

RPH8002	RESEARCH THESIS 2 FULL TIME	48

CENTRE FOR ENVIRONMENTAL AND RISK ENGINEERING

Year 1, Semester 1

VQT8001	RESEARCH THESIS 1 FULL TIME	48

Year 1, Semester 2

VQT8002	RESEARCH THESIS 2 FULL TIME	48

Year 2, Semester 1

VQT8001	RESEARCH THESIS 1 FULL TIME	48

Year 2, Semester 2

VQT8002	RESEARCH THESIS 2 FULL TIME	48

PART TIME

SCHOOL OF ENGINEERING AND SCIENCE

Civil & Building Engineering stream

Year 1, Semester 1

VCC8011	RESEARCH THESIS (PART-TIME)	24

Year 1, Semester 2

VCC8012	RESEARCH THESIS (PART TIME)	24

Year 2, Semester 1

VCC8011	RESEARCH THESIS (PART-TIME)	24

Year 2, Semester 2

VCC8012	RESEARCH THESIS (PART TIME)	24

Year 3, Semester 1

VCC8011	RESEARCH THESIS (PART-TIME)	24

Year 3, Semester 2

VCC8012	RESEARCH THESIS (PART TIME)	24

Year 4, Semester 1

VCC8011	RESEARCH THESIS (PART-TIME)	24

Year 4, Semester 2

VCC8012	RESEARCH THESIS (PART TIME)	24

Electrical Engineering stream

Year 1, Semester 1

VEE8011	RESEARCH THESIS 1 PART TIME	24

Year 1, Semester 2

VEE8012	RESEARCH THESIS 2 PART TIME	24

Year 2, Semester 1

VEE8011	RESEARCH THESIS 1 PART TIME	24

Year 2, Semester 2

VEE8012	RESEARCH THESIS 2 PART TIME	24

Year 3, Semester 1

VEE8011	RESEARCH THESIS 1 PART TIME	24

Year 3, Semester 2

VEE8012	RESEARCH THESIS 2 PART TIME	24

Year 4, Semester 1

VEE8011	RESEARCH THESIS 1 PART TIME	24

Year 4, Semester 2

VEE8012	RESEARCH THESIS 2 PART TIME	24

Mechanical Engineering stream

Year 1, Semester 1

VMR8011	RESEARCH THESIS 1 PART TIME	24

Year 1, Semester 2

VMR8012	RESEARCH THESIS 2 PART TIME	24

Year 2, Semester 1

VMR8011	RESEARCH THESIS 1 PART TIME	24

Year 2, Semester 2

VMR8012	RESEARCH THESIS 2 PART TIME	24

Year 3, Semester 1

VMR8011	RESEARCH THESIS 1 PART TIME	24

Year 3, Semester 2

VMR8012	RESEARCH THESIS 2 PART TIME	24

Year 4, Semester 1

VMR8011	RESEARCH THESIS 1 PART TIME	24

Year 4, Semester 2

VMR8012	RESEARCH THESIS 2 PART TIME	24

Packaging Stream

Year 1, Semester 1

VPP8011	RESEARCH THESIS 1 PART TIME	24

Year 1, Semester 2

VPP8012	RESEARCH THESIS 2 PART TIME	24

Year 2, Semester 1

VPP8011	RESEARCH THESIS 1 PART TIME	24

Year 2, Semester 2

VPP8012	RESEARCH THESIS 2 PART TIME	24

Year 3, Semester 1

VPP8011	RESEARCH THESIS 1 PART TIME	24

Year 3, Semester 2

VPP8012	RESEARCH THESIS 2 PART TIME	24

Year 4, Semester 1

VPP8011	RESEARCH THESIS 1 PART TIME	24

Year 4, Semester 2

VPP8012	RESEARCH THESIS 2 PART TIME	24

Transportation stream

Year 1, Semester 2

VPT8011	RESEARCH THESIS 1 PART TIME	24

Year 2, Semester 2

VPT8012	RESEARCH THESIS 2 PART TIME	24

Year 2, Semester 1

VPT8011	RESEARCH THESIS 1 PART TIME	24

Year 2, Semester 2

VPT8012	RESEARCH THESIS 2 PART TIME	24

Year 3, Semester 1

VPT8011 RESEARCH THESIS 1 PART TIME 24

Year 3, Semester 2

VPT8012 RESEARCH THESIS 2 PART TIME 24

Year 4, Semester 1

VPT8011 RESEARCH THESIS 1 PART TIME 24

Year 4, Semester 2

VPT8012 RESEARCH THESIS 2 PART TIME 24

Physics stream

Year 1, Semester 1

RPH8011 RESEARCH THESIS 1 PART TIME 24

Year 1, Semester 2

RPH8012 RESEARCH THESIS 2 PART TIME 24

Year 2, Semester 1<b/

RPH8011 RESEARCH THESIS 1 PART TIME 24

Year 2, Semester 2<b/

RPH8012 RESEARCH THESIS 2 PART TIME 24

Year 3, Semester 1

RPH8011 RESEARCH THESIS 1 PART TIME 24

Year 3, Semester 2

RPH8012 RESEARCH THESIS 2 PART TIME 24

Year 4, Semester 1

RPH8011 RESEARCH THESIS 1 PART TIME 24

Year 4, Semester 2

RPH8012 RESEARCH THESIS 2 PART TIME 24

CENTRE FOR ENVIRONMENTAL AND RISK ENGINEERING

Year 1, Semester 1

VQT8011 RESEARCH THESIS 1 PART TIME 24

Year 1, Semester 2

VQT8012 RESEARCH THESIS 2 PART TIME 24

Year 2, Semester 1

VQT8011 RESEARCH THESIS 1 PART TIME 24

Year 2, Semester 2

VQT8012 RESEARCH THESIS 2 PART TIME 24

Year 3, Semester 1

VQT8011 RESEARCH THESIS 1 PART TIME 24

Year 3, Semester 2

VQT8012 RESEARCH THESIS 2 PART TIME 24

Year 4, Semester 1

VQT8011 RESEARCH THESIS 1 PART TIME 24

Year 4, Semester 2

VQT8012 RESEARCH THESIS 2 PART TIME 24

MASTER OF ENGINEERING (CESARE)

Course Code:ERQR
Campus: Werribee.

About this course: The Centre for Environment Safety and Risk Engineering (CESARE) has earned a world-renowned reputation for enhancing knowledge of smoke and flame growth and propagation, numerical modelling of fire dynamics, developing innovative techniques for risk assessment of fire safety systems, developing a greatly improved smoke alarm, predicting structural behaviour in fire and understanding various aspects of human behaviour. Many of these research activities have been conducted in collaboration with Australian fire and building regulatory bodies, local industry partners and the US based Fire Protection Research Foundation. Students will acquire knowledge and research skills in one of the areas above, different forms of communication in varied formats and settings as well as professional and communication ethics. This course is suitable for students interested in pursuing a career locally or internationally.

Course Objectives: This Course is designed to enhance the students' range of knowledge in various research fields relating to building and fire safety and risk engineering and to enable a focusing of practical skills into the specific research area. It is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university process.

Careers: Firesafety Researcher, Fire Safety Professional, PhD, research assistant, research technician.

Course Duration:2 years

Admission Requirements International: An IELTS (Academic Module) result with an overall score of 6.5 (no band less than 6) and a four year bachelor degree in Engineering, Building Surveying, Computer Science, Physics or Chemistry or an equivalent combination of qualifications and experience.

Admission Requirements Mature Age:A four year bachelor degree in Engineering, Building Surveying, Computer Science, Physics or Chemistry or an equivalent combination of qualifications and experience.

COURSE STRUCTURE

The course normally requires two years of full-time study.

Year 1, Semester 1

VQT8001	RESEARCH THESIS 1 FULL TIME	48

Year 1, Semester 2

VQT8002	RESEARCH THESIS 2 FULL TIME	48

Year 2, Semester 1

VQT8001	RESEARCH THESIS 1 FULL TIME	48

Year 2, Semester 2

VQT8002	RESEARCH THESIS 2 FULL TIME	48

GRADUATE CERTIFICATE IN PROJECT MANAGEMENT

Course Code:ETPR
Campus: Footscray Park.

Course Objectives: To provide students with a conceptual understanding of relevant models, modes of analysis and techniques for understanding and carrying out project management, contract management and procurement. They will also have developed the ability to apply and evaluate these models, modes of analysis and technique in the context of the legal, ethical and accountability requirements which apply. In addition to the technical skills provided in the course, graduates will have developed strong relevant professional skills as well as strong personal, interpersonal and organisational attributes. By utilising a consultative committee of current project management professionals, the course has been designed to meet the needs of project managers in industry, equip professionals already in industry with advanced principles and techniques to enable them to assume the role of project manager and/or become an effective member of project management teams and adopt a unique approach to manage people, resources, time line and risks to achieve a successful project outcome.

Careers: This course is designed to equip professionals with advanced project management principles and techniques, enabling graduates to assume the role of project manager and/or become effective members of project management teams.

Course Duration:0.5 years

Admission Requirements Other:A Degree or a Diploma in any discipline and a minimum of 2 years post-qualification experience. The requirement of qualification may be waived in exceptional circumstance on the basis of experience.

COURSE STRUCTURE

One Semester (full time) or Maximum two years (part time)

Year 1, Semester 1

Course structure consists of two project management core units plus two college based elective units.

Project Management Core Units

VPP5600	PRINCIPLES OF PROJECT MANAGEMENT	12

College of Business stream

BMO5602	BUSINESS PROJECT MANAGEMENT	12
BMO6624	ORGANISATION CHANGE MANAGEMENT	12

College of Arts Stream

BAO5505	ACCOUNTING FOR EVENTS	12
VCP5705	PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY	12

College of Engineering and Science Stream

VPP5621	PROJECT RISK MANAGEMENT	12
VCP5726	PROJECT PROCUREMENT MANAGEMENT	12

Year 1, Semester 2

Project Management Core Units

VPP5610	PROJECT PLANNING AND CONTROL	12

College of Business Stream

BHO6505	MARKETING MANAGEMENT	12
BMO6622	MANAGING INNOVATION AND ENTREPRENEURSHIP	12

College of Arts Stream

AHB5202	SPORT EVENT MANAGEMENT	12
VCP5736	FACILITY LIFE CYCLE COSTING	12

College of Engineering and Science Stream

VPP5620	PROJECT STAKEHOLDERS MANAGEMENT	12
VPP5716	PROJECT DEVELOPMENT ANALYSIS AND REVIEW	12

Students who successfully complete four required units are eligible to graduate with a Graduate Certificate in Project Management. Students who are enrolled in the Graduate Diploma in Project Management or Master of Project Management are not eligible to apply but may exit with a Graduate Certificate in Project Management.

GRADUATE CERTIFICATE IN PERFORMANCE-BASED BUILDING & FIRE CODES

Course Code:ETQB
Campus: Werribee.

About this course: The Graduate Certificate in Performance Based Building and Fire Codes is designed to present the concepts behind fire safety engineering, such that graduates have an appreciation and an understanding of what should be included into a fire safety engineering design, in addition to acquiring some of the techniques available for carrying out the necessary calculations to demonstrate that an adequate level of safety has been achieved. The approach adopted in the presentation of the course material does not presuppose detailed knowledge and, as such, will be suitable for building surveyors and building engineers from other disciplines, as well as consolidating the knowledge of fire safety practitioners. The course does not teach engineering design, but sets out to illustrate for those who will be involved in assessing such designs, the approach to adopt, what to look for, questions to ask and how to reach a conclusion.

Course Objectives: The course aims to enable building surveyors and other allied professionals to:

- make professional use of performance-based building codes;
- employ the concepts and alternative acceptable frameworks for performance-based codes, with particular, but not exclusive, emphasis given to fire safety engineering design;
- acquire appropriate knowledge and skills necessary for the assessment and application of performance-based building and fire codes;
- explain the basic physics and chemistry governing ignition, fire growth and spread, smoke movement and fire extinguishment and structural behaviour during fire;
- apply relevant concepts concerning occupant communication and response in relation to fire cues;
- discuss basic fire safety engineering analysis through the use of assessment tools;
- develop a professional approach to performance-based codes and a recognition of when to assess designs which are within a person's field of expertise and when to refer designs to a more appropriately qualified assessor;
- develop an appreciation of the legal, statutory and design integrity requirements and the need for compliance of the design assumptions throughout the operational life of the building.

Careers: Enables a graduate (in conjunction with a Diploma in Building Surveying) to become a Relevant Building Surveyor (RBS) capable of determining compliance of an alternative building design solution.

Course Duration:1 year

Admission Requirements Mature Age: To qualify for admission to the course, an applicant must have successfully completed a diploma in Building Surveying or an equivalent qualification and at least two years of relevant professional experience. Candidates with other academic qualifications can be admitted to the course provided they can demonstrate an equivalent combination of additional relevant professional experience and qualifications. A letter of recommendation and an interview may be required.

COURSE STRUCTURE

The course is offered on a part-time basis over one year, and is offered in block modules (four blocks of four to five days, a total of four blocks spread throughout the year). Students must complete 48 credit points.

Year 1, Semester 1

VQB5611	RISK ASSESSMENT AND HUMAN BEHAVIOUR	12
VQB5612	SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALS	12

Year 1, Semester 2

VQB5641	FIRE SAFETY SYSTEMS DESIGN	12
VQB5642	PERFORMANCE CODES METHODOLOGY AND STRUCTURE	12

Assessment

Assessments will be conducted through a combination of assignments and an examination. Distribution of marks among each aspect of assessment is determined individually for each unit.

Guidelines on the use of electronic calculators and other electronic storage devices in examinations are provided in individual unit outlines distributed to students within the first two weeks of semester and included on final examination papers.

Electronic calculators and other electronic storage devices will not be permitted where the above provisions have not been met.

DOCTOR OF PHILOSOPHY

Course Code:HPEN

Campus: Werribee, Footscray Park, This course is also available off-campus..

About this course: PhD is an advanced research program, which allows the students to conduct original research in an area that is both of interest to the student and of broader significance to the University, industry and the community, with the assistance of an experienced research supervisor. It promotes the development of research skills and training, including ethics, critical appraisal of the literature, development of oral presentations skills and techniques, and the production of a thesis and scholarly articles in journals and peer-reviewed conferences. This course provides graduates with the necessary skills to conduct research suitable to add to the knowledge base of Chemical Engineering, Civil Engineering, Electrical and Electronic Engineering, Mechanical Engineering or Computer Engineering, and allows the students to become independent, competent and highly sought-after researchers to pursue a research career in the industry and/or to become an academic.

Course Objectives: Graduates of this course have the academic knowledge, skills and attributes necessary to become capable, independent researchers, in order to be able to pursue a research-related or high level professional career in their industry and/or as a Higher Education academic in their field of studies. The course objectives are to produce graduates who have:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field.
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem.
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem.
- develop, adapt and implement research methodologies to extend and redefine existing knowledge.
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature.

- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning.
- ethical practice and full responsibility and accountability for personal outputs.
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Careers: Academic and research focused postions in the relevant fields of study.

Course Duration:4 years

Admission Requirements International: Achieved an IELTS (Academic Module) result with an overall score of 6.5 (no band less than 6), or equivalent, and completed a Masters degree or a relevant four year undergraduate degree with Honours or its equivalent at a high standard.

Admission Requirements Other: Completed a Masters degree or a relevant four year undergraduate degree with Honours or its equivalent at a high standard.

COURSE STRUCTURE

PhD is a research based degree with a maximum duration of 4 years (full time) and 8 years (part time).

Chemical Engineering

Semester 1

HLP6901	RESEARCH THESIS (FULL TIME)	48
HLP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HLP6902	RESEARCH THESIS (FULL TIME)	48
HLP6912	RESEARCH THESIS (PART TIME)	24

Civil Engineering

Semester 1

HCP6901	RESEARCH THESIS (FULL TIME)	48
HCP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HCP6902	RESEARCH THESIS (FULL TIME)	48
HCP6912	RESEARCH THESIS (PART TIME)	24

Computer Engineering

Semester 1

HTP6901	RESEARCH THESIS (FULL TIME)	48
HTP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HTP6902	RESEARCH THESIS (FULL TIME)	48
HTP6912	RESEARCH THESIS (PART TIME)	24

Electrical Engineering

Semester 1

HEP6901	RESEARCH THESIS (FULL TIME)	48
HEP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HEP6902	RESEARCH THESIS (FULL TIME)	48
HEP6912	RESEARCH THESIS (PART TIME)	24

Mechanical Engineering

Semester 1

HMP6901	RESEARCH THESIS (FULL TIME)	48
HMP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HMP6902	RESEARCH THESIS (FULL TIME)	48
HMP6912	RESEARCH THESIS (PART TIME)	24

DOCTOR OF PHILOSOPHY

Course Code:HPIM
Campus: Footscray Park, This course is also available off-campus..

About this course: PhD is an advanced research program, which allows the students to conduct original research in an area that is both of interest to the student and of broader significance to the University, industry and the community, with the assistance of an experienced research supervisor. It promotes the development of research skills and training, including ethics, critical appraisal of the literature, development of oral presentations skills and techniques, and the production of a thesis and scholarly articles in journals and peer-reviewed conferences. This course provides graduates with the necessary skills to conduct research suitable to add to the knowledge base of Information or Mathematical Sciences, and allows the students to become independent, competent and highly sought-after researchers to pursue a research career in the industry and/or to become an academic.

Course Objectives: Graduates of this course have the academic knowledge, skills and attributes necessary to become capable, independent researchers, in order to be able to pursue a research-related or high level professional career in their industry and/or as a Higher Education academic in their field of studies. The course objectives are to produce graduates who have:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field.
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem.
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem.
- develop, adapt and implement research methodologies to extend and redefine existing knowledge.
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature.
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning.
- ethical practice and full responsibility and accountability for personal outputs.
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Careers: Academic and research focused positions in the relevant fields of study.

Course Duration: 4 years

Admission Requirements International: Achieved an IELTS (Academic Module) result with an overall score of 6.5 (no band less than 6) or equivalent and completed a Masters degree or a relevant four year undergraduate degree with Honours or its equivalent at a high standard.

Admission Requirements Other: Completed a Masters degree or a relevant four year undergraduate degree with Honours or its equivalent at a high standard.

COURSE STRUCTURE

PhD is a research based degree with a maximum duration of 4 years (full time) and 8 years (part time).

Information Sciences

Semester 1

HIP6901	RESEARCH THESIS (FULL TIME)	48
HIP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HIP6902	RESEARCH THESIS (FULL TIME)	48
HIP6912	RESEARCH THESIS (PART TIME)	24

Mathematics

Semester 1

HAP6901	RESEARCH THESIS (FULL TIME)	48
HAP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HAP6902	RESEARCH THESIS (FULL TIME)	48
HAP6912	RESEARCH THESIS (PART TIME)	24

DOCTOR OF PHILOSOPHY

Course Code: HPIN
Campus: Various, dependent on the research field..
This course is for Continuing students only.

About this course: The Doctor of Philosophy (PhD) is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university processes. Students may include some coursework studies during their candidature as recommended by the university. Academic staff, with suitable qualifications and proven research skills, supervise students in various research fields across health, engineering and science.

Course Objectives: Graduates of this course have the academic knowledge, skills and attributes necessary to become capable, independent researchers, in order to be able to pursue a research-related or high level professional career in their industry and/or as a Higher Education academic in their field of studies. The course objectives are to produce graduates who have:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field.
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem.
- expert cognitive, technical and creative skills to: - design, develop and implement a research project/s to systematically investigate a research problem. - develop, adapt and implement research methodologies to

extend and redefine existing knowledge. - manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature.

- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning.
- ethical practice and full responsibility and accountability for personal outputs.
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Careers: Academic and research focused postions in the relevant fields of study.

Course Duration:4 years

Admission Requirements International:1) Achieved an IELTS, or equivalent, (Academic Module) result with an overall score of 6.5 (no band less than 6) 2) Completed a Masters degree or a relevant four year undergraduate degree with Honours or its equivalent at a high standard.

COURSE STRUCTURE

This is a 384 credit point course which normally requires four years of full-time study or part-time equivalent.

SCHOOL OF ENGINEERING AND SCIENCE

Civil and Building Stream

Semester 1

VCC8001	RESEARCH THESIS FULL TIME	48
VCC8011	RESEARCH THESIS (PART-TIME)	24

Semester 2

VCC8002	RESEARCH THESIS FULL TIME	48
VCC8012	RESEARCH THESIS (PART TIME)	24

Chemical Sciences Stream

Semester 1

RCS8001	RESEARCH THESIS 1 FULL TIME	48
RCS8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCS8002	RESEARCH THESIS 2 FULL TIME	48
RCS8012	RESEARCH THESIS 2 PART TIME	24

Computer Science and Mathematics Stream

Semester 1

RCM8001	RESEARCH THESIS 1 FULL TIME	48
RCM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCM8002	RESEARCH THESIS 2 FULL TIME	48
RCM8012	RESEARCH THESIS 2 PART TIME	24

Ecology & Sustainability and Biotechnology Streams

Semester 1

RBT8001	RESEARCH THESIS 1 FULL TIME	48
RBT8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBT8002	RESEARCH THESIS - SEM 2 (FULL-TIME)	48
RBT8012	RESEARCH THESIS - SEM 2 (PART-TIME)	24

Electrical Engineering Stream

Semester 1

VEE8001	RESEARCH THESIS 1 FULL TIME	48
VEE8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

VEE8002	RESEARCH THESIS 2 FULL TIME	48
VEE8012	RESEARCH THESIS 2 PART TIME	24

Mechanical Stream

Semester 1

VMR8001	RESEARCH THESIS 1 FULL TIME	48
VMR8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

VMR8002	RESEARCH THESIS 2 FULL TIME	48
VMR8012	RESEARCH THESIS 2 PART TIME	24

Packaging and Polymer Stream

Semester 1

VPP8001	RESEARCH THESIS 1 FULL TIME	48
VPP8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

VPP8002	RESEARCH THESIS 2 FULL TIME	48
VPP8012	RESEARCH THESIS 2 PART TIME	24

Transportation Stream

Semester 1

VPP8001	RESEARCH THESIS 1 FULL TIME	48
VPP8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

VPP8002	RESEARCH THESIS 2 FULL TIME	48
VPP8012	RESEARCH THESIS 2 PART TIME	24

SCHOOL OF BIOMEDICAL AND HEALTH SCIENCES

Australian Food Marketing Centre (as of July 2010 there will be no new intakes into this stream)

Semester 1

REM8001	RESEARCH THESIS 1 FULL TIME	48
REM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

REM8002	RESEARCH THESIS 2 FULL TIME	48
REM8012	RESEARCH THESIS 2 PART TIME	24

Biomedical Sciences Stream

Semester 1

RBM8001	RESEARCH THESIS 1 FULL TIME	48
RBM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBM8002	RESEARCH THESIS 2 FULL TIME	48
RBM8012	RESEARCH THESIS 2 PART TIME	24

Food Science Stream

Semester 1

RBF8001	RESEARCH THESIS 1 FULL TIME	48
RBF8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBF8002	RESEARCH THESIS 2 FULL TIME	48
RBF8012	RESEARCH THESIS 2 PART TIME	24

Health Sciences Stream

Semester 1

HHM6800	RESEARCH THESIS (FULL-TIME)	48
HHM6801	RESEARCH THESIS (PART-TIME)	24

Semester 2

HHM6800	RESEARCH THESIS (FULL-TIME)	48
HHM6801	RESEARCH THESIS (PART-TIME)	24

CENTRE FOR ENVIRONMENTAL SAFETY AND RISK ENGINEERING

Semester 1

VQT8001	RESEARCH THESIS 1 FULL TIME	48
VQT8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

VQT8002	RESEARCH THESIS 2 FULL TIME	48
VQT8012	RESEARCH THESIS 2 PART TIME	24

CENTRE FOR TELECOMMUNICATIONS AND MICRO-ELECTRONICS

Physics Stream

Semester 1

RPH8001	RESEARCH THESIS 1 FULL TIME	48
RPH8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RPH8002	RESEARCH THESIS 2 FULL TIME	48
RPH8012	RESEARCH THESIS 2 PART TIME	24

SCHOOL OF NURSING AND MIDWIFERY

Semester 1

HNM6800	RESEARCH THESIS (FULL-TIME)	48
HNM6801	RESEARCH THESIS (PART-TIME)	24

Semester 2

HNM6800	RESEARCH THESIS (FULL-TIME)	48
HNM6801	RESEARCH THESIS (PART-TIME)	24

DOCTOR OF PHILOSOPHY

Course Code:HPNP

Campus: Werribee, Footscray Park, St Albans, This course is also available off-campus..

About this course: PhD is an advanced research program, which allows the students to conduct original research in an area that is both of interest to the student and of broader significance to the University, industry and the community, with the assistance of an experienced research supervisor. It promotes the development of research skills and training, including ethics, critical appraisal of the literature, development of oral presentations skills and techniques, and the production of a thesis and scholarly articles in journals and peer-reviewed conferences. The course provides graduates with the necessary skills to conduct research suitable to add to the knowledge base of Biotechnology, Chemical Sciences, Ecology or Physical Sciences and allows the students to become independent, competent and highly sought-after researchers to pursue a research career in the industry and/or to become an academic.

Course Objectives: Graduates of this course have the academic knowledge, skills and attributes necessary to become capable, independent researchers, in order to be able to pursue a research-related or high level professional career in their industry and/or as a Higher Education academic in their field of studies. The course objectives are to produce graduates who have:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field.
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem.
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem.
- develop, adapt and implement research methodologies to extend and redefine existing knowledge.
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature.
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning.
- ethical practice and full responsibility and accountability for personal outputs.
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Careers: Academic and research focused positions in the relevant fields of study.

Course Duration:4 years

Admission Requirements International: Achieved an IELTS, (Academic Module) result with an overall score of 6.5 (no band less than 6) or equivalent and completed a Masters degree or a relevant four year undergraduate degree with Honours or its equivalent at a high standard.

Admission Requirements Other: Completed a Masters degree or a relevant four year undergraduate degree with Honours or its equivalent at a high standard.

COURSE STRUCTURE

PhD is a research based degree with a maximum duration of 4 years (full time) and 8 years (part time).

Biotechnology

Semester 1

HOP6901	RESEARCH THESIS (FULL TIME)	48
HOP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HOP6902	RESEARCH THESIS (FULL TIME)	48
HOP6912	RESEARCH THESIS (PART TIME)	24

Chemical Sciences

Semester 1

HSP6901	RESEARCH THESIS (FULL TIME)	48
HSP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HSP6902	RESEARCH THESIS (FULL TIME)	48
HSP6912	RESEARCH THESIS (PART TIME)	24

Ecology

Semester 1

HGP6901	RESEARCH THESIS (FULL TIME)	48
HGP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HGP6902	RESEARCH THESIS (FULL TIME)	48
HGP6912	RESEARCH THESIS (PART TIME)	24

Physical Sciences

Semester 1

HPP6901	RESEARCH THESIS (FULL TIME)	48
HPP6911	RESEARCH THESIS (PART TIME)	24

Semester 2

HPP6902	RESEARCH THESIS (FULL TIME)	48
HPP6912	RESEARCH THESIS (PART TIME)	24

CERTIFICATE III IN INFORMATION, DIGITAL MEDIA AND TECHNOLOGY

Course Code:ICA30111
Campus: Werribee, Footscray Nicholson, Industry, City Flinders.

About this course: Learn the skills of an IT technical support or help desk officer. This course provides the knowledge to perform a variety of IT skills across the industry.

Course Objectives: This qualification provides the skills and knowledge for an individual to be competent in a wide range of general Information and Communication Technology (ICT) 'technical' functions and to achieve a degree of self-sufficiency as an advanced ICT 'user'. Persons working at this level will support information technology activities in the workplace across a wide range of ICT areas including technical support, network administration, web technologies, software applications and digital media technologies.

Careers: Possible job titles relevant to this qualification include:

- help desk officer
- help desk assistant
- ICT operations support
- ICT user support
- PC support
- technical support.

Course Duration:0.5 years

Admission Requirements Year 12: Successful completion of VCE or equivalent.

Admission Requirements International:IELTS 5.5 or equivalent.

Admission Requirements Other: As assessed by the University

Selection Processes: Direct Entry

COURSE STRUCTURE

To qualify for the Certificate III in Information, Digital Media and Technology, participants must successfully complete a total of 17 units of study, comprising of 6 core units and 11 electives units in accordance with the packaging rules specified in ICA11 Information and Communications Technology Training Package.

Core Units

BSBOHS302B	PARTICIPATE EFFECTIVELY IN OHS COMMUNICATION AND CONSULTATIVE PROCESSES	30
BSBSUS301A	IMPLEMENT AND MONITOR ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	40
ICAICT202A	WORK AND COMMUNICATE EFFECTIVELY IN AN IT ENVIRONMENT	40
ICAICT301A	CREATE USER DOCUMENTATION	20
ICAICT302A	INSTALL AND OPTIMISE OPERATING SYSTEM SOFTWARE	20
ICASAS301A	RUN STANDARD DIAGNOSTIC TESTS	20

Elective Units (11 required, selected as per the Training Package rules and the University)

BSBITU303A	DESIGN AND PRODUCE TEXT DOCUMENTS	90
BSBITU304A	PRODUCE SPREADSHEETS	35
ICAICT203A	OPERATE APPLICATION SOFTWARE PACKAGES	60
ICAICT303A	CONNECT INTERNAL HARDWARE COMPONENTS	20
ICAICT304A	IMPLEMENT SYSTEM SOFTWARE CHANGES	40
ICAICT305A	IDENTIFY AND USE CURRENT INDUSTRY-SPECIFIC TECHNOLOGIES	60
ICAICT306A	MIGRATE TO NEW TECHNOLOGY	20
ICAICT307A	CUSTOMISE PACKAGED SOFTWARE APPLICATIONS FOR CLIENTS	80
ICAICT308A	USE ADVANCED FEATURES OF COMPUTER APPLICATIONS	40
ICAICT409A	DEVELOP MACROS AND TEMPLATES FOR CLIENTS USING STANDARD PRODUCTS	60
ICANWK301A	PROVIDE NETWORK SYSTEMS ADMINISTRATION	60
ICANWK302A	DETERMINE AND ACTION NETWORK PROBLEMS	50
ICANWK303A	CONFIGURE AND ADMINISTER A NETWORK OPERATING SYSTEM	70
ICANWK304A	ADMINISTER NETWORK PERIPHERALS	20
ICANWK305A	INSTALL AND MANAGE NETWORK PROTOCOLS	40
ICANWK405A	BUILD A SMALL WIRELESS LOCAL AREA NETWORK	20
ICAPRG301A	APPLY INTRODUCTORY PROGRAMMING TECHNIQUES	40

ICASAS303A	CARE FOR COMPUTER HARDWARE	20
ICASAS304A	PROVIDE BASIC SYSTEM ADMINISTRATION	20
ICASAS305A	PROVIDE IT ADVICE TO CLIENTS	40
ICASAS306A	MAINTAIN EQUIPMENT AND SOFTWARE	20
ICASAS307A	INSTALL, CONFIGURE AND SECURE A SMALL OFFICE HOME OFFICE NETWORK	50
ICASAS405A	IDENTIFY AND EVALUATE IT INDUSTRY VENDOR TECHNOLOGIES	10
ICAWEB301A	CREATE A SIMPLE MARKUP LANGUAGE DOCUMENT	30
ICAWEB201A	USE SOCIAL MEDIA TOOLS FOR COLLABORATION AND ENGAGEMENT	20
ICAWEB303A	PRODUCE DIGITAL IMAGES FOR THE WEB	30

CERTIFICATE IV IN INFORMATION TECHNOLOGY

Course Code:ICA40111
Campus: Werribee, Footscray Nicholson, Industry, City Flinders.

About this course: This qualification provides the skills and knowledge for an individual to be competent in a wide range of general information and communications technology (ICT) technologies and to support small to medium enterprises (SMEs) that require broader ICT support. Persons working at this level apply a wide range of knowledge and skills in basic networking, IT support, database development, programming and web development support; working safely and ethically in a sustainable work environment.

Course Objectives: This qualification provides the skills and knowledge for an individual to be competent in a wide range of general information and communications technology (ICT) technologies and to support small to medium enterprises (SMEs) that require broader ICT support. Persons working at this level apply a wide range of knowledge and skills in basic networking, IT support, database development, programming and web development support; working safely and ethically in a sustainable work environment.

Careers: Possible job titles relevant to this qualification include:

- computer technician
- customer support
- customer support professional
- information systems operator
- PC support
- systems administrator
- systems support
- user support technician
- network operations technician.

Course Duration:0.5 years

Admission Requirements Year 12: Successful completion of VCE or equivalent

Admission Requirements International:IELTS 5.5 or equivalent

Admission Requirements Mature Age: As assessed by the University

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

To qualify for the Certificate IV in Information, Digital Media and Technology, participants must successfully complete a total of 20 units of study, comprising of 5 core units and 15 electives units in accordance with the packaging rules specified in ICA11 Information and Communications Technology Training Package.

Core Units

ICAICT202A	WORK AND COMMUNICATE EFFECTIVELY IN AN IT ENVIRONMENT	40
ICAICT401A	DETERMINE AND CONFIRM CLIENT BUSINESS REQUIREMENTS	40
ICAICT418A	CONTRIBUTE TO COPYRIGHT, ETHICS AND PRIVACY IN AN IT ENVIRONMENT	40
BSBOHS302B	PARTICIPATE EFFECTIVELY IN OHS COMMUNICATION AND CONSULTATIVE PROCESSES	30
BSBSUS301A	IMPLEMENT AND MONITOR ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	40

Elective Units (15 required, selected as per the Training Package rules and the University)

BSBCRT401A	ARTICULATE, PRESENT AND DEBATE IDEAS	40
ICADBS403A	CREATE BASIC DATABASES	40
ICAICT408A	CREATE TECHNICAL DOCUMENTATION	20
ICANWK401A	INSTALL AND MANAGE A SERVER	40
ICANWK402A	INSTALL AND CONFIGURE VIRTUAL MACHINES FOR SUSTAINABLE ICT	50
ICAPMG401A	SUPPORT SMALL SCALE IT PROJECTS	60
ICAPRG406A	APPLY INTRODUCTORY OBJECT-ORIENTED LANGUAGE SKILLS	60
ICAPRG417A	APPLY MATHEMATICAL TECHNIQUES FOR SOFTWARE DEVELOPMENT	30
ICAPRG425A	USE STRUCTURED QUERY LANGUAGE	60
ICASAS419A	SUPPORT SYSTEM SOFTWARE	50
ICAWEB402A	CONFIRM ACCESSIBILITY OF WEBSITES FOR PEOPLE WITH SPECIAL NEEDS	10
ICAWEB409A	DEVELOP CASCADING STYLE SHEETS	20
ICAWEB411A	PRODUCE BASIC CLIENT-SIDE SCRIPT FOR DYNAMIC WEB	40

	PAGES	
ICAWEB414A	DESIGN SIMPLE WEB PAGE LAYOUTS	50
ICAWEB429A	CREATE A MARKUP LANGUAGE DOCUMENT TO SPECIFICATION	20

DIPLOMA OF INFORMATION TECHNOLOGY

Course Code:ICA50111

Campus: Werribee, Footscray Nicholson, City Flinders, St Albans.

About this course: This course helps you develop the skills and knowledge in a range of Information Technology fields allowing you to progress your qualifications and career in IT.

Course Objectives: This qualification provides the skills and knowledge for an individual to administer and manage information and communications technology (ICT) support in small-to-medium enterprises (SMEs) using a wide range of general ICT technologies. Persons working at this level provide a broader rather than specialised ICT support function, applying a wide range of higher level technical skills in ICT areas such as networking, IT support, database development, programming and web development.

- Information systems office manager
- Office systems administrator
- IT office manager
- IT systems administrator
- Systems manager

Careers:

Course Duration:1 year

Admission Requirements Year 12:ICA40111 Certificate IV in Information Technology, or other relevant qualifications or units equivalent to the core of ICA40111

Admission Requirements International:IELTS 5.5 or equivalent

Admission Requirements Mature Age:ICA40111 Certificate IV in Information Technology,other relevant qualifications or units equivalent to the core of ICA40111 OR demonstrated vocational experience in a range of work environments using a wide range of information technologies

Admission Requirements VET:ICA40111 Certificate IV in Information Technology, or other relevant qualifications or units equivalent to the core of ICA40111

Selection Processes: Direct Entry, Interview, Written Application, VTAC

COURSE STRUCTURE

To qualify for the Diploma of Website Development, participants must successfully complete a total of 20 units of study, comprising of 4 core units and 16 electives units in accordance with the packaging rules specified in ICA11 Information and Communications Technology Training Package and the University's selection.

Core Units

BSBOHS509A	ENSURE A SAFE WORKPLACE	60
BSBSUS501A	DEVELOP WORKPLACE POLICY AND PROCEDURES FOR SUSTAINABILITY	50
ICAICT509A	GATHER DATA TO IDENTIFY BUSINESS REQUIREMENTS	30
ICAICT511A	MATCH IT NEEDS WITH THE STRATEGIC DIRECTION OF THE ENTERPRISE	50

Elective Units (16 required, selected as per the Training Package rules and the University)

ICADBS502A	DESIGN A DATABASE	50
ICADBS504A	INTEGRATE DATABASE WITH A WEBSITE	25
ICAICT406A	BUILD A GRAPHICAL USER INTERFACE	20
ICAICT509A	GATHER DATA TO IDENTIFY BUSINESS REQUIREMENTS	30
ICAICT511A	MATCH IT NEEDS WITH THE STRATEGIC DIRECTION OF THE ENTERPRISE	50
ICAICT514A	IDENTIFY AND MANAGE THE IMPLEMENTATION OF CURRENT INDUSTRY-SPECIFIC TECHNOLOGIES	60
ICAICT515A	VERIFY CLIENT BUSINESS REQUIREMENTS	40
ICANWK506A	CONFIGURE, VERIFY AND TROUBLESHOOT WAN LINKS AND IP SERVICES IN A MEDIUM ENTERPRISE NETWORK	90
ICANWK507A	INSTALL, OPERATE AND TROUBLESHOOT MEDIUM ENTERPRISE ROUTERS	120
ICANWK508A	INSTALL, OPERATE AND TROUBLESHOOT MEDIUM ENTERPRISE SWITCHES	90
ICANWK516A	DETERMINE BEST-FIT TOPOLOGY FOR A LOCAL NETWORK	20
ICAPMG501A	MANAGE IT PROJECTS	80
ICAPRG527A	APPLY INTERMEDIATE OBJECT-ORIENTED LANGUAGE SKILLS	60
ICASAS502A	ESTABLISH AND MAINTAIN CLIENT USER LIAISON	20
ICASAS512A	REVIEW AND MANAGE DELIVERY OF MAINTENANCE SERVICES	20
ICASAS514A	PERFORM INTEGRATION TESTS	30
ICASAS517A	USE NETWORK TOOLS	50
ICAWEB411A	PRODUCE BASIC CLIENT-SIDE SCRIPT FOR DYNAMIC WEB PAGES	40
ICAWEB414A	DESIGN SIMPLE WEB PAGE LAYOUTS	50
ICAWEB429A	CREATE A MARKUP LANGUAGE DOCUMENT TO SPECIFICATION	20

ICAWEB501A	BUILD A DYNAMIC WEBSITE	60

DIPLOMA OF INFORMATION TECHNOLOGY NETWORKING

Course Code: ICA50411

Campus: Werribee, Footscray Nicholson, Industry, City Flinders, St Albans.

About this course: Further your career in IT with a course in networking. Learn the skills and knowledge to design, build, install and manage ICT networks.

Course Objectives: This qualification provides the skills and knowledge for an individual to manage, as an independent ICT specialist or as part of a team, the installation of a range of networks, including internetworking, security and e-business integration.

Careers: Possible job titles relevant to this qualification include:

- network administrator
- IT administrator
- IT operations administrator
- network services administrator
- network support coordinator
- network operations analyst
- network security coordinator
- network e-business coordinator

Course Duration: 1 year

Admission Requirements Year 12: Successful completion of VCE or equivalent

Admission Requirements International: IELTS 5.5 or equivalent

Admission Requirements Mature Age: As assessed by the University.

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

To qualify for the Diploma of Information Technology Networking, participants must successfully complete a total of 16 units of study, comprising of 5 core units and 11 electives units in accordance with the packaging rules specified in ICA11 Information and Communications Technology Training Package.

ICAICT418A	CONTRIBUTE TO COPYRIGHT, ETHICS AND PRIVACY IN AN IT ENVIRONMENT	40
ICAICT511A	MATCH IT NEEDS WITH THE STRATEGIC DIRECTION OF THE ENTERPRISE	50
ICANWK529A	INSTALL AND MANAGE COMPLEX ICT NETWORKS	100
ICTSUS5187A	IMPLEMENT SERVER VIRTUALISATION FOR A SUSTAINABLE ICT SYSTEM	80
ICTTEN6206A	PRODUCE AN ICT NETWORK ARCHITECTURE DESIGN	60
ICAICT514A	IDENTIFY AND MANAGE THE IMPLEMENTATION OF CURRENT INDUSTRY-SPECIFIC TECHNOLOGIES	60
ICANWK501A	PLAN, IMPLEMENT AND TEST ENTERPRISE COMMUNICATION SOLUTIONS	80
ICANWK504A	DESIGN AND IMPLEMENT AN INTEGRATED SERVER SOLUTION	50
ICANWK505A	DESIGN, BUILD AND TEST A NETWORK SERVER	50
ICANWK506A	CONFIGURE, VERIFY AND TROUBLESHOOT WAN LINKS AND IP SERVICES IN A MEDIUM ENTERPRISE NETWORK	90
ICANWK507A	INSTALL, OPERATE AND TROUBLESHOOT MEDIUM ENTERPRISE ROUTERS	120
ICANWK508A	INSTALL, OPERATE AND TROUBLESHOOT MEDIUM ENTERPRISE SWITCHES	90
ICANWK516A	DETERMINE BEST-FIT TOPOLOGY FOR A LOCAL NETWORK	20
ICANWK525A	CONFIGURE AN ENTERPRISE VIRTUAL COMPUTING ENVIRONMENT	60
ICAPMG501A	MANAGE IT PROJECTS	80
ICASAS502A	ESTABLISH AND MAINTAIN CLIENT USER LIAISON	20
ICASAS512A	REVIEW AND MANAGE DELIVERY OF MAINTENANCE SERVICES	20
ICASAS517A	USE NETWORK TOOLS	50
ICTSUS6233A	INTEGRATE SUSTAINABILITY IN ICT PLANNING AND DESIGN PROJECTS	55

DIPLOMA OF WEBSITE DEVELOPMENT

Course Code: ICA50611

Campus: Werribee, Footscray Nicholson, Industry, City Flinders, St Albans.

About this course: Learn the skills required of a senior ICT professional. In this Diploma course you will study website development from design, development, site performance and database integration through to implementation and user acceptance testing.

Course Objectives: This qualification provides the skills and knowledge for an individual to design, build and manage websites as an independent web developer or as part of a team.

Careers: Possible job titles relevant to this qualification include:

- web developer
- web development manager
- web programmer
- webmaster
- web administrator
- internet developer.

Course Duration: 1 year

Admission Requirements Year 12: Successful completion of VCE or equivalent

Admission Requirements International: IELTS 5.5 or equivalent

Admission Requirements Mature Age: As assessed by the University

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

To qualify for the Diploma of Website Development, participants must successfully complete a total of 20 units of study, comprising of 8 core units and 12 electives units in accordance with the packaging rules specified in ICA11 Information and Communications Technology Training Package and the University's selection.

Core Units

BSBOHS509A	ENSURE A SAFE WORKPLACE	60
ICADBS504A	INTEGRATE DATABASE WITH A WEBSITE	25
ICAICT418A	CONTRIBUTE TO COPYRIGHT, ETHICS AND PRIVACY IN AN IT ENVIRONMENT	40
ICAICT515A	VERIFY CLIENT BUSINESS REQUIREMENTS	40
ICAWEB501A	BUILD A DYNAMIC WEBSITE	60
ICAWEB502A	CREATE DYNAMIC WEB PAGES	40
ICAWEB503A	CREATE WEB-BASED PROGRAMS	60
ICAWEB516A	RESEARCH AND APPLY EMERGING WEB TECHNOLOGY TRENDS	80

Elective Units (12 required, selected as per the Training Package rules and the University)

BSBSUS501A	DEVELOP WORKPLACE POLICY AND PROCEDURES FOR SUSTAINABILITY	50
ICADBS502A	DESIGN A DATABASE	50
ICADMT402A	PRODUCE INTERACTIVE ANIMATION	60
ICADMT403A	PRODUCE AND EDIT DIGITAL IMAGES	40
ICADMT501A	INCORPORATE AND EDIT DIGITAL VIDEO	50
ICAICT503A	VALIDATE QUALITY AND COMPLETENESS OF SYSTEM DESIGN SPECIFICATIONS	20
ICAICT509A	GATHER DATA TO IDENTIFY BUSINESS REQUIREMENTS	30
ICAPMG501A	MANAGE IT PROJECTS	80
ICAPRG409A	DEVELOP MOBILE APPLICATIONS	50
ICAPRG527A	APPLY INTERMEDIATE OBJECT-ORIENTED LANGUAGE SKILLS	60
ICASAD501A	MODEL DATA OBJECTS	30
ICASAD502A	MODEL DATA PROCESSES	30
ICASAD506A	PRODUCE A FEASIBILITY REPORT	30
ICAWEB504A	BUILD A DOCUMENT USING EXTENSIBLE MARKUP LANGUAGE	30
ICAWEB505A	DEVELOP COMPLEX WEB PAGE LAYOUTS	40
ICAWEB506A	DEVELOP COMPLEX CASCADING STYLE SHEETS	40
ICAWEB507A	CUSTOMISE A COMPLEX IT CONTENT MANAGEMENT SYSTEM	80
ICAWEB509A	USE SITE SERVER TOOLS FOR TRANSACTION MANAGEMENT	20
ICAWEB510A	ANALYSE INFORMATION AND ASSIGN META-TAGS	20
ICAWEB511A	IMPLEMENT QUALITY ASSURANCE PROCESS FOR WEBSITES	20
ICAWEB512A	ADMINISTER BUSINESS WEBSITES AND SERVERS	30

ADVANCED DIPLOMA OF INFORMATION TECHNOLOGY

Course Code: ICA60111
Campus: Footscray Nicholson, Industry, City Flinders, St Albans.

About this course: Specialise in an area of IT and develop a sound knowledge in either Knowledge Management or e-Learning.

Course Objectives: This qualification provides high level information and communications technology (ICT), process improvement and business skills and knowledge to enable an individual to be effective in senior ICT roles within organisations. The qualification builds on a base core of management competencies, with specialist and general elective choices to suit particular ICT and business needs, especially in the areas of knowledge management and systems development.

- knowledge manager
- manager IT infrastructure solutions
- business development manager
- software manager.

Careers:

Course Duration: 0.5 years

Admission Requirements Year 12: Entry point via Diploma level qualifications

Admission Requirements International: IELTS 5.5 or equivalent AND ICA50611 Diploma of Website Development, TDIT Diploma of Information Technology OR other equivalent qualifications

Admission Requirements Mature Age: ICA50611 Diploma of Website Development, TDIT Diploma of Information Technology OR other relevant qualifications OR units equivalent to the core of ICA50611 OR demonstrated vocational experience in a range of work environments using a wide range of information technologies

Selection Processes: Direct Entry, Interview, VTAC

COURSE STRUCTURE

To successfully complete this qualification, participants must complete a total of 16 units (5 core units, 5 System Development specialist units plus 6 electives) as specified by the Training Package or as per the University's selection.

Core Units

BSBWOR502A	ENSURE TEAM EFFECTIVENESS	60
ICAICT608A	INTERACT WITH CLIENTS ON A BUSINESS LEVEL	40
ICAICT610A	MANAGE COPYRIGHT, ETHICS AND PRIVACY IN AN IT ENVIRONMENT	30
ICAPMG609A	PLAN AND DIRECT COMPLEX IT PROJECTS	80
ICTSUS6233A	INTEGRATE SUSTAINABILITY IN ICT PLANNING AND DESIGN PROJECTS	55

Specialist System Development Units

ICAICT508A	EVALUATE VENDOR PRODUCTS AND EQUIPMENT	20
ICAICT602A	DEVELOP CONTRACTS AND MANAGE CONTRACTED PERFORMANCE	30
ICASAD504A	IMPLEMENT QUALITY ASSURANCE PROCESSES FOR BUSINESS SOLUTIONS	30
ICASAD505A	DEVELOP TECHNICAL REQUIREMENTS FOR BUSINESS SOLUTIONS	30
ICASAS601A	IMPLEMENT CHANGE-MANAGEMENT PROCESSES	30

Elective Units

ICAICT603A	MANAGE THE USE OF APPROPRIATE DEVELOPMENT METHODOLOGIES	30
ICAICT606A	DEVELOP COMMUNITIES OF PRACTICE	30
ICAICT609A	LEAD THE EVALUATION AND IMPLEMENTATION OF CURRENT INDUSTRY-SPECIFIC TECHNOLOGIES	80
ICAPRG601A	DEVELOP ADVANCED MOBILE MULTI-TOUCH APPLICATIONS	80
ICAPRG602A	MANAGE THE DEVELOPMENT OF TECHNICAL SOLUTIONS FROM BUSINESS SPECIFICATIONS	40
ICAPRG603A	CREATE CLOUD COMPUTING SERVICES	60

ADVANCED DIPLOMA OF NETWORK SECURITY

Course Code:ICA60211
Campus: Werribee, Footscray Nicholson, Industry, City Flinders.

About this course: This qualification provides the skills and knowledge for an individual to plan, design, manage and monitor an enterprise information and communications technology (ICT) network as an independent ICT specialist or as part of a team responsible for advanced ICT network security systems. The qualification has a high-level ICT technical base with appropriate security units and the ability to specialise in a number of areas, including voice, wireless, network infrastructure and sustainability.

Course Objectives: This qualification provides the skills and knowledge for an individual to plan, design, manage and monitor an enterprise information and communications technology (ICT) network as an independent ICT specialist or as part of a team responsible for advanced ICT network security systems. The qualification has a high-level ICT technical base with appropriate security units and the ability to specialise in a number of areas, including voice, wireless, network infrastructure and sustainability.

Careers: Possible job titles relevant to this qualification include:

- e-security specialist
- ICT security specialist
- IT security administrator
- IT security analyst
- IT security specialist
- systems/network administrator
- network security analyst
- network security specialist
- network security administrator
- senior network administrator
- systems security analyst.

Course Duration:1 year

Admission Requirements Year 12: Successful completion of VCE or equivalent after achieving ICA50411 Diploma of Information Technology or equivalent, or documented vocational experience in a range of work environments in senior network support roles.

Admission Requirements International:IELTS 5.5 or equivalent after achieving ICA50411 Diploma of Information Technology or equivalent, or documented vocational experience in a range of work environments in senior network support roles.

Admission Requirements Mature Age: As assessed by the University after achieving ICA50411 Diploma of Information Technology or equivalent, or documented vocational experience in a range of work environments in senior network support roles.

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

To qualify for the Advanced Diploma of Network Security, participants must successfully complete a total of 12 units of study, comprising of 5 core units and 7 electives units in accordance with the packaging rules specified in ICA11 Information and Communications Technology Training Package.

Core Units

ICANWK502A	IMPLEMENT SECURE ENCRYPTION TECHNOLOGIES	20
ICANWK509A	DESIGN AND IMPLEMENT A SECURITY PERIMETER FOR ICT	60

	NETWORKS	
ICANWK601A	DESIGN AND IMPLEMENT A SECURITY SYSTEM	90
ICANWK602A	PLAN, CONFIGURE AND TEST ADVANCED SERVER BASED SECURITY	80
ICTSUS6233A	INTEGRATE SUSTAINABILITY IN ICT PLANNING AND DESIGN PROJECTS	55

Elective Units (7 required, selected as per the Training Package rules and the University)

ICANWK606A	IMPLEMENT VOICE APPLICATIONS OVER SECURE WIRELESS NETWORKS	60
ICANWK609A	CONFIGURE AND MANAGE INTRUSION PREVENTION SYSTEM ON NETWORK SENSORS	40
ICANWK610A	DESIGN AND BUILD INTEGRATED VOIP NETWORKS	50
ICANWK611A	CONFIGURE CALL PROCESSING NETWORK ELEMENTS FOR SECURE VOIP NETWORKS	40
ICAICT609A	LEAD THE EVALUATION AND IMPLEMENTATION OF CURRENT INDUSTRY-SPECIFIC TECHNOLOGIES	80
ICAPMG609A	PLAN AND DIRECT COMPLEX IT PROJECTS	80
ICASAS601A	IMPLEMENT CHANGE-MANAGEMENT PROCESSES	30

DIPLOMA OF ENGINEERING - ADVANCED TRADE

Course Code:MEM50105
Campus: Sunshine.

About this course: This qualification provides the skills and knowledge to demonstrate: broad theoretical concepts;application of skills and knowledge;problem sloving; information interpretation and output responsibility.

Course Objectives: This qualification provides the skills and knowledge to demonstrate: broad theoretical concepts;application of skills and knowledge;problem solving; information interpretation and output responsibility.

Careers: Technical Officer, Engineering Assistant

Course Duration:2 years

Admission Requirements Other: To qualify for admission to the course, applicants must have successfully completed year 11 or completed Certificate III in Engineering or equivalent or have a minimum language, literacy and numeracy skills that is equivalent to level 3 of the National Reporting System (NRS).

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

4 years part-timePart-time, Flexible.

Core Units of Study

MEM12023A	PERFORM ENGINEERING MEASUREMENTS	30
MEM12024A	PERFORM COMPUTATIONS	30
MEM12025A	USE GRAPHICAL TECHNIQUES AND PERFORM SIMPLE STATISTICAL COMPUTATIONS	20
MEM13014A	APPLY PRINCIPLES OF WORK OH&S IN WORK ENVIRONMENT	10
MEM14004A	PLAN TO UNDERTAKE A ROUTINE TASK	10
MEM14005A	PLAN A COMPLETE ACTIVITY	20
MEM15024A	APPLY QUALITY PROCEDURES	10
MEM15002A	APPLY QUALITY SYSTEMS	20
MEM16006A	ORGANISE AND COMMUNICATE INFORMATION	20
MEM16007A	WORK WITH OTHERS IN A MANUFACTURING, ENGINEERING OR RELATED ENVIRONMENT	10
MEM16008A	INTERACT WITH COMPUTING TECHNOLOGY	20
MEM16009A	RESEARCH AND ANALYSE ENGINEERING INFORMATION	20
MEM16011A	COMMUNICATE WITH INDIVIDUALS AND SMALL GROUPS	20
MEM16012A	INTERPRET SPECIFICATIONS AND MANUALS	40
MEM16014A	REPORT TECHNICAL INFORMATION	20
MEM17003A	ASSIST IN THE PROVISION OF ON THE JOB TRAINING	20
MEM30012A	APPLY MATHEMATICAL TECHNIQUES IN A MANUFACTURING, ENGINEERING OR RELATED	40
MSAENV272B	PARTICIPATE IN ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	30

Elective Units of Study

MEM03001B	PERFORM MANUAL PRODUCTION ASSEMBLY	40
MEM03003B	PERFORM SHEET AND PLATE ASSEMBLY	40
MEM03006B	SET ASSEMBLY STATIONS	20
MEM04018B	PERFORM GENERAL WOODWORKING MACHINE OPS	40
MEM05001B	PERFORM MANUAL SOLDERING/DESOLD - ELEC	40
MEM05003B	PERFORM SOFT SOLDERING	20
MEM05004C	PERFORM ROUTINE OXY ACETYLENE WELDING	20
MEM05005B	CARRY OUT MECHANICAL CUTTING	20
MEM05006B	PERFORM BRAZING AND/OR SILVER SOLDERING	20

MEM05007C	PERFORM MANUAL HEATING & THERMAL CUTTING	20
MEM05008C	PERFORM ADV MANUAL THERMAL CUT, GOUG SHA	20
MEM05009C	PERFORM AUTOMATED THERMAL CUTTING	20
MEM05012C	PERFORM ROUTINE MANUAL METAL ARC WELDING	20
MEM05014C	MONITOR QUALITY OF PRODUCTION WELDING/FAB	20
MEM05013C	PERFORM MANUAL PRODUCTION WELDING	20
MEM05016C	PERFORM ADV WELDING USING MAN METAL ARC	40
MEM05018C	PERFORM ADV WELDING USING GAS METAL ARC	40
MEM05020C	PERFORM ADV WELD USING GAS TUNGSTEN ARC	40
MEM05023C	WELD USING SUBMERGED ARC WELDING PROCESS	40
MEM05026B	APPLY WELDING PRINCIPLES	40
MEM05038B	PERFORM ADV GEOMETRIC DEVELOPMENT - CYLIND/REC	20
MEM05039B	PERFORM ADV GEOMETRIC DEVELOP - CONICAL	20
MEM05040B	PERFORM ADV GEOMETRIC DEVEL - TRANSITION	40
MEM05043B	PERFORMS WELDS TO CODE STAND USE GAS META	60
MEM05044B	PERFORM WELDS TO DOCE STAND USE GAS TUNG	60
MEM05046B	PERFORM WELDS TO CODE STAND USE MAN META	60
MEM05047B	WELD USING FLUX ARC WELDING PROCESS	40
MEM05049B	PERFORM ROUTINE GAS TUNGSTEN ARC WELDING	20
MEM05051A	SELECT WELDING PROCESSES	20
MEM05052A	APPLY SAFE WELDING PRACTICES	40
MEM07015B	SET COMPUTER CONTROLLED MACHINES/PROCESS	20
MEM07024B	OPERATE AND MONITOR MACHINE/PROCESS	40
MEM07032B	USE WORKSHOP MACHINES FOR BASIC OPERATION	20
MEM09002B	INTERPRET TECHNICAL DRAWING	40
MEM09009C	CREATE 2D DRAWINGS USE COMP AIDED DESIGN	80
MEM10002B	TERMINATE AND CONNECT ELECTRICAL WIRING	30
MEM10004B	ENTER AND CHANGE PROG CONTROLLER OP PARAMETERS	20
MEM10005B	COMMISSION PROGRAMMABLE CONTROL PROGRAMS	40
MEM10006B	INSTALL MACHINE/PLANT	40
MEM11007B	ADMINISTER INVENTORY PROCEDURES	40
MEM11011B	UNDERTAKE MANUAL HANDLING	20
MEM12003B	PERFORM PRECISION MECHANICAL MEASUREMENT	20
MEM12007D	MARK OFF/OUT STRUCTURAL FABRICATIONS AND SHAPES	40
MEM13001B	PERFORM EMERGENCY FIRST AID	10
MEM14002B	UNDERTAKE BASIC PROCESS PLANNING	80
MEM15001B	PERFORM BASIC STATISTICAL QUALITY CONTROL	20
MEM15002A	APPLY QUALITY SYSTEMS	20
MEM15004B	PERFORM INSPECTION	20
MEM16004B	PERFORM INTERNAL/EXTERNAL CUSTOMER SERVICE	20
MEM16005A	OPERATE AS A TEAM MEMBER TO CONDUCT MAN, ENG	20
MEM16010A	WRITE REPORTS	20
MEM18001C	USE HAND TOOLS	20
MEM18002B	USE POWER TOOLS/HAND HELD OPERATIONS	20
MEM18004B	MAINTAIN AND OVERHAUL MECHANICAL EQUIP	40
MEM18005B	PERFORM FAULT DIAGNOSTICS, INSTALL AND REMOVE BEARINGS	40
MEM18007B	MAINTAIN AND REPAIR MECHANICAL DRIVES AND MECHANICAL TRANSMISSION ASS	40
MEM18001C	USE HAND TOOLS	20
MEM04007B	POUR MOLTEN METAL	40
MEM08007B	CONTROL SURFACE FINISH PRODUCTION AND FINISHED PRODUCT QUALITY	40
MEM08009C	MAKE UP SOLUTIONS	20
MEM09004B	PERFORM ELECTRICAL/ELECTRONIC DETAIL DRAFTING	80
MEM10003B	INSTALL AND TEST ELECTRICAL WIRING AND CIRCUITS UP TO 1000 VOLTS A.C. AND	120
MEM10007C	MODIFY CONTROL SYSTEMS	60
MEM10008B	UNDERTAKE COMMISSIONING PROCEDURES FOR PLANT AND/OR EQUIPMENT	40
MEM11005B	PICK AND PROCESS ORDER	40
MEM11006B	PERFORM PRODUCTION PACKAGING	20
MEM11008B	PACKAGE MATERIALS (STORES AND WAREHOUSE)	20
MEM11013B	UNDERTAKE WAREHOUSE RECEIVAL PROCESS	40

MEM11014B	UNDERTAKE WAREHOUSE DISPATCH PROCE	40
MEM12004B	PERFORM PRECISION ELECTRICAL/ELECTRONIC MEASUREMENT	40
MEM18030B	DIAGNOSE AND RECTIFY LOW VOLTAGE ELECTRICAL SYSTEMS	80
MEM18037B	DIAGNOSE AND RECTIFY LOW VOLTAGE CHARGING SYSTEMS	20
MEM18051B	FAULT FIND AND REPAIR/RECTIFY COMPLEX ELECTRICAL CIRCUITS	60
MEM18054B	FAULT FIND, TEST AND CALIBRATE INSTRUMENTATION SYSTEMS AND EQUIPMENT	80
MEM05010C	APPLY FABRICATION, FORMING AND SHAPING TECHNIQUES	80
MEM05011D	ASSEMBLE FABRICATED COMPONENTS	80
MEM05015D	WELD USING MANUAL METAL ARC WELDING PROCESS	40
MEM05017D	WELD USING GAS METAL ARC WELDING PROCESS	40
MEM05019D	WELD USING GAS TUNGSTEN ARC WELDING PROCESS	40
MEM12006C	MARK OFF/OUT (GENERAL ENGINEERING)	40
MEM09008B	PERFORM ADVANCED STRUCTURAL DETAIL DRAFTING	40
MEM17002B	MEM17002B	20
MEM10001C	ERECT STRUCTURES	40

DIPLOMA OF ENGINEERING - TECHNICAL

Course Code:MEM50211
Campus: Sunshine, Off-shore.

About this course: Upgrade your qualifications and direct your career into working as a technician in engineering technology. This leading-edge, technology-focused course also provides a non-trades pathway into technician and engineering associate qualifications – the Advanced Diploma of Engineering Technology or the Bachelor of Engineering.

Course Objectives: This qualification reflects the role of individuals who are competent in a prescribed range of engineering skills. This qualification prepares students to work autonomously within the engineering industry. Work is undertaken as a technician in the mechanical and civil stream of the Engineering industry.

Careers:• Environmental And Structural Civil Engineering • Mechanical Engineering • Manufacturing Engineering • Computer Aided Drafting (Cad)

Course Duration:1 year

Admission Requirements Year 12: Successful Completion of VCE

Admission Requirements Mature Age: Minimum age of 18 and one year out of school

Admission Requirements VET: Successful Completion of VCE

Selection Processes: Direct Entry, Interview, VTAC

COURSE STRUCTURE

The minimum requirements for achievement of the Diploma of Engineering - Technical are:

- completion of the five core units of competency listed below, and
- 15 elective units, to bring the total number of units to 20.

Elective units must be selected as follows:

- up to eight general elective units from the list in Group A,
- at least seven specialist elective units from Group B, to bring the total number of elective units to 15.

Core Units of Study

MEM16008A	INTERACT WITH COMPUTING TECHNOLOGY	20
MEM30007A	SELECT COMMON ENGINEERING MATERIALS	40
MEM30012A	APPLY MATHEMATICAL TECHNIQUES IN A MANUFACTURING, ENGINEERING OR RELATED	40
MSAENV272B	PARTICIPATE IN ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	30
MEM16006A	ORGANISE AND COMMUNICATE INFORMATION	20

Group A - General Electives - select up to eight

MEM12024A	PERFORM COMPUTATIONS	30
MEM15001B	PERFORM BASIC STATISTICAL QUALITY CONTROL	20
MEM18001C	USE HAND TOOLS	20
MEM30001A	USE COMPUTER AIDED DRAFTING SYSTEMS TO PRODUCE BASIC ENGINEERING DRAWINGS	40
MEM30003A	PRODUCE DETAILED ENGINEERING DRAWINGS	80
MEM30004A	USE CAD TO CREATE AND DISPLAY 3D MODELS	40
MEM30005A	CALCULATE FORCE SYSTEMS WITHIN SIMPLE BEAM STRUCTURES	40
MEM30006A	CALCULATE STRESSES IN SIMPLE STRUCTURES	40
MEM30009A	CONTRIBUTE TO THE DESIGN OF BASIC MECHANICAL SYSTEMS	40
MEM30010A	SET UP BASIC HYDRAULIC CIRCUITS	40
MEM30011A	SET UP BASIC PNEUMATIC CIRCUITS	40
MEM30013A	ASSIST IN THE PREPARATION OF A BASIC WORKPLACE	20

	LAYOUT	
MEM30020A	DEVELOP AND MANAGE A PLAN FOR A SIMPLE MANUFACTURING RELATED PROJECT	30
MEM30025A	ANALYSE A SIMPLE ELECTRICAL SYSTEM CIRCUIT	40
MSAENV472B	IMPLEMENT AND MONITOR ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	40

Group B- General Electives - select up to seven

MEM09141A	REPRESENT MECHANICAL ENGINEERING DESIGNS	80
MEM09142A	REPRESENT MECHATRONIC ENGINEERING DESIGNS	80
MEM09004B	PERFORM ELECTRICAL/ELECTRONIC DETAIL DRAFTING	80
MEM12022B	PROGRAM CO-ORDINATE MEASURING MACHINE (ADV)	20
MEM12025A	USE GRAPHICAL TECHNIQUES AND PERFORM SIMPLE STATISTICAL COMPUTATIONS	20
MEM13010A	SUPERVISE OCCUPATIONAL HEALTH AND SAFETY IN AN INDUSTRIAL WORK ENVIRONMENT	40
MEM14081A	APPLY MECHANICAL ENGINEERING FUNDAMENTALS TO SUPPORT DESIGN AND DEVELOPMENT OF PROJECTS	60
MEM14082A	APPLY MECHATRONICS FUNDAMENTALS TO SUPPORT DESIGN AND DEVELOPMENT OF ENGINEERING PROJECTS	60
MEM15008B	PERFORM ADVANCED STATISTICAL QUALITY CONTROL	20
MEM22002A	MANAGE SELF IN THE ENGINEERING ENVIRONMENT	40
MEM23001A	APPLY ADVANCED MATHEMATICAL TECHNIQUES IN A MANUFACTURING ENGINEERING OR RELATED ENVIRONMENT	80
MEM23003A	OPERATE AND PROGRAM COMPUTERS AND/OR CONTROLLERS IN ENGINEERING SITUATIONS	80
MEM23041A	APPLY BASIC SCIENTIFIC PRINCIPLES AND TECHNIQUES IN MECHANICAL ENGINEERING SITUATIONS	80
MEM23061A	SELECT AND TEST MECHANICAL ENGINEERING MATERIALS	60
MEM23062A	SELECT AND TEST MECHATRONIC ENGINEERING MATERIALS	60
MEM23071A	SELECT AND APPLY MECHANICAL ENGINEERING METHODS, PROCESSES AND CONSTRUCTION TECHNIQUES	60
MEM23072A	SELECT AND APPLY MECHATRONIC ENGINEERING METHODS, PROCESSES AND CONSTRUCTION TECHNIQUES	60
MEM24011B	ESTABLISH NON-DESTRUCTIVE TESTS	120
MSACMC611A	MANAGE PEOPLE RELATIONSHIPS	60
MSACMT670A	DEVELOP AND MANAGE SUSTAINABLE ENERGY PRACTICES	70
MSACMT671A	DEVELOP AND MANAGE SUSTAINABLE ENVIRONMENTAL PRACTICES	60
MSACMT452A	APPLY STATISTICS TO PROCESSES IN MANUFACTURING	40

ADVANCED DIPLOMA OF ENGINEERING

Course Code:MEM60111
Campus: Industry, Sunshine, Off-shore.

About this course: Equip yourself for a career in the engineering industries by improving your existing skills in CAD, robotics, and advanced manufacturing. This flexible nature of this course allows customisation for industry needs.

Course Objectives: This qualification reflects the role of individuals who are competent in a prescribed range of engineering skills. This qualification prepares students to work autonomously within the engineering industry. Work is undertaken as a technician in the mechanical and civil stream of the Engineering industry. This qualification reflects the role of individuals who are competent in a prescribed range of advanced engineering skills, including computer aided design, the application of materials science, mathematical solutions to advanced engineering problems, as well as design mechatronics. Work is undertaken as an advanced engineering technician the mechanical and civil stream of the Engineering industry.

Careers:• Advanced Technical Worker • Manager in Engineering

Course Duration:2 years

Admission Requirements Year 12: Successful Completion of VCE

Admission Requirements International:IELTS: 5.5 or equivalent

Admission Requirements Mature Age: Minimum age of 18 and one year out of school

Admission Requirements VET: Successful Completion of VCE

Selection Processes: Direct Entry, Interview, VTAC

COURSE STRUCTURE

The minimum requirements for achievement of the Advanced Diploma of Engineering are:

- completion of the seven core units of competency listed below, and
- completion of 23 elective units, to bring the total number of units to 30.

Group A and Group B elective units must be selected as follows:

- up to eight general elective units from the list in Group A
- at least 15 specialist elective units from Group B, to bring the total number of elective units to 23

Core Units of Study

MEM16006A	ORGANISE AND COMMUNICATE INFORMATION	20
MEM16008A	INTERACT WITH COMPUTING TECHNOLOGY	20

MEM30007A	SELECT COMMON ENGINEERING MATERIALS	40
MEM30012A	APPLY MATHEMATICAL TECHNIQUES IN A MANUFACTURING, ENGINEERING OR RELATED	40
MSAENV272B	PARTICIPATE IN ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	30
MEM22001A	PERFORM ENGINEERING ACTIVITIES	60
MEM22002A	MANAGE SELF IN THE ENGINEERING ENVIRONMENT	40

Group A Elective Units of Study

MEM12024A	PERFORM COMPUTATIONS	30
MEM15001B	PERFORM BASIC STATISTICAL QUALITY CONTROL	20
MEM18001C	USE HAND TOOLS	20
MEM24001B	PERFORM BASIC PENETRANT TESTING	20
MEM24003B	PERFORM BASIC MAGNETIC PARTICLE TESTING	40
MEM24007B	PERFORM ULTRASONIC THICKNESS TESTING	20
MEM24009B	PERFORM BASIC RADIOGRAPHIC TESTING	20
MEM30001A	USE COMPUTER AIDED DRAFTING SYSTEMS TO PRODUCE BASIC ENGINEERING DRAWINGS	40
MEM30002A	PRODUCE BASIC ENGINEERING GRAPHICS	40
MEM30003A	PRODUCE DETAILED ENGINEERING DRAWINGS	80
MEM30004A	USE CAD TO CREATE AND DISPLAY 3D MODELS	40
MEM30005A	CALCULATE FORCE SYSTEMS WITHIN SIMPLE BEAM STRUCTURES	40
MEM30006A	CALCULATE STRESSES IN SIMPLE STRUCTURES	40
MEM30008A	APPLY BASIC ECONOMIC AND ERGONOMIC CONCEPTS TO EVALUATE ENGINEERING	40
MEM30009A	CONTRIBUTE TO THE DESIGN OF BASIC MECHANICAL SYSTEMS	40
MEM30010A	SET UP BASIC HYDRAULIC CIRCUITS	40
MEM30011A	SET UP BASIC PNEUMATIC CIRCUITS	40
MEM30013A	ASSIST IN THE PREPARATION OF A BASIC WORKPLACE LAYOUT	20
MEM30017A	USE BASIC PREVENTATIVE MAINTENANCE TECHNIQUES AND TOOLS	40
MEM30018A	UNDERTAKE BASIC PROCESS PLANNING	20
MEM30020A	DEVELOP AND MANAGE A PLAN FOR A SIMPLE MANUFACTURING RELATED PROJECT	30
MEM30024A	PARTICIPATE IN QUALITY ASSURANCE TECHNIQUES	30
MEM30025A	ANALYSE A SIMPLE ELECTRICAL SYSTEM CIRCUIT	40
MEM30026A	SELECT AND TEST COMPONENTS FOR SIMPLE ELECTRONIC SWITCHING AND TIMING CIRCUITS	20
MSAENV472B	IMPLEMENT AND MONITOR ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES	40

Group B Elective Units of Study

MEM09141A	REPRESENT MECHANICAL ENGINEERING DESIGNS	80
MEM09142A	REPRESENT MECHATRONIC ENGINEERING DESIGNS	80
MEM09004B	PERFORM ELECTRICAL/ELECTRONIC DETAIL DRAFTING	80
MEM09005B	PERFORM BASIC ENGINEERING DETAIL DRAFTING	80
MEM09151A	APPLY COMPUTER AIDED MODELLING AND DATA MANAGEMENT TECHNIQUES TO MECHANICAL ENGINEERING DESIGNS	80
MEM09152A	APPLY COMPUTER AIDED MODELLING AND DATA MANAGEMENT TECHNIQUES TO MECHATRONIC ENGINEERING DESIGNS	80
MEM12022B	PROGRAM CO-ORDINATE MEASURING MACHINE (ADV)	20
MEM12025A	USE GRAPHICAL TECHNIQUES AND PERFORM SIMPLE STATISTICAL COMPUTATIONS	20
MEM13010A	SUPERVISE OCCUPATIONAL HEALTH AND SAFETY IN AN INDUSTRIAL WORK ENVIRONMENT	40
MEM14002B	UNDERTAKE BASIC PROCESS PLANNING	80
MEM14061A	PLAN AND DESIGN MECHANICAL ENGINEERING PROJECTS	60
MEM22002A	MANAGE SELF IN THE ENGINEERING ENVIRONMENT	40
MEM22006A	SOURCE AND ESTIMATE MATERIALS	40
MEM23001A	APPLY ADVANCED MATHEMATICAL TECHNIQUES IN A MANUFACTURING ENGINEERING OR RELATED ENVIRONMENT	80
MEM23002A	APPLY CALCULUS IN ENGINEERING SITUATIONS	80
MEM22005A	MANAGE ENGINEERING OPERATIONS	60
MEM22006A	SOURCE AND ESTIMATE MATERIALS	40
MEM22007A	MANAGE ENVIRONMENTAL EFFECTS OF ENGINEERING ACTIVITIES	60

MEM22008A	MANAGE CHANGE AND TECHNICAL DEVELOPMENT	40
MEM22009A	MANAGE TECHNICAL SALES AND PROMOTION	60
MEM23001A	APPLY ADVANCED MATHEMATICAL TECHNIQUES IN A MANUFACTURING ENGINEERING OR RELATED ENVIRONMENT	80
MEM23002A	APPLY CALCULUS IN ENGINEERING SITUATIONS	80
MEM23003A	OPERATE AND PROGRAM COMPUTERS AND/OR CONTROLLERS IN ENGINEERING SITUATIONS	80
MEM14062A	PLAN AND DESIGN MECHATRONIC ENGINEERING PROJECTS	60
MEM14063A	PLAN AND DESIGN MANUFACTURING ENGINEERING PROJECTS	60
MEM14064A	PLAN AND DESIGN MAINTENANCE ENGINEERING PROJECTS	60
MEM14081A	APPLY MECHANICAL ENGINEERING FUNDAMENTALS TO SUPPORT DESIGN AND DEVELOPMENT OF PROJECTS	60
MEM14082A	APPLY MECHATRONICS FUNDAMENTALS TO SUPPORT DESIGN AND DEVELOPMENT OF ENGINEERING PROJECTS	60
MEM15007B	CONDUCT PRODUCT AND/OR PROCESS CAPABILITY STUDIES	60
MEM15008B	PERFORM ADVANCED STATISTICAL QUALITY CONTROL	20
MEM15011B	EXERCISE EXTERNAL QUALITY ASSURANCE	60
MEM24004B	PERFORM MAGNETIC PARTICLE TESTING	40
MEM24011B	ESTABLISH NON-DESTRUCTIVE TESTS	120
MEM15012B	MAINTAIN/SUPERVISE THE APPLICATION OF QUALITY PROCEDURES	40
MEM23041A	APPLY BASIC SCIENTIFIC PRINCIPLES AND TECHNIQUES IN MECHANICAL ENGINEERING SITUATIONS	80
MEM23051A	APPLY BASIC ELECTRO AND CONTROL SCIENTIFIC PRINCIPLES AND TECHNIQUES IN MECHANICAL AND MANUFACTURING ENGINEERING SITUATIONS	80
MEM23052A	APPLY BASIC ELECTRO AND CONTROL SCIENTIFIC PRINCIPLES AND TECHNIQUES IN AERONAUTICAL ENGINEERING SITUATIONS	60
MEM23061A	SELECT AND TEST MECHANICAL ENGINEERING MATERIALS	60
MEM23062A	SELECT AND TEST MECHATRONIC ENGINEERING MATERIALS	60
MEM23072A	SELECT AND APPLY MECHATRONIC ENGINEERING METHODS, PROCESSES AND CONSTRUCTION TECHNIQUES	60
MEM23081A	APPLY SCIENTIFIC PRINCIPLES AND TECHNIQUES IN MECHANICAL ENGINEERING SITUATIONS	60
MEM23082A	APPLY SCIENTIFIC PRINCIPLES AND TECHNIQUES IN MECHATRONIC ENGINEERING SITUATIONS	60
MEM23083A	APPLY INDUSTRIAL ENGINEERING PRINCIPLES AND TECHNIQUES IN COMPETITIVE MANUFACTURING ENGINEERING SITUATIONS	60
MEM23091A	APPLY MECHANICAL SYSTEM DESIGN PRINCIPLES AND TECHNIQUES IN MECHANICAL ENGINEERING SITUATIONS	60
MEM24012C	APPLY METALLURGY PRINCIPLES	40
MSACMT670A	DEVELOP AND MANAGE SUSTAINABLE ENERGY PRACTICES	70
MSACMT671A	DEVELOP AND MANAGE SUSTAINABLE ENVIRONMENTAL PRACTICES	60
MSACMS401A	ENSURE PROCESS IMPROVEMENTS ARE SUSTAINED	50
MSAENV672B	DEVELOP WORKPLACE POLICY AND PROCEDURES FOR SUSTAINABILITY	50

BACHELOR OF SCIENCE (ECOLOGY AND SUSTAINABILITY)

Course Code:SBES
Campus: Werribee.
This course is for Continuing students only.

About this course: Prospective students please refer Bachelor of Science (Specialisation) - SBSS course. This degree teaches students skills to perform a wide range of ecological and environmental science activities. It provides an awareness of environmental issues and community studies. Students also learn skills to communicate their ecological knowledge. The course is practical and flexible, allowing a mix of in-depth studies and specialisations with novel combinations of units of study across diverse disciplines not usually covered in science courses.

Course Objectives: This course provides the flexible combinations of professional education and technical training that are required to develop the practical solutions necessary to achieve sustainable management of the Australian environment. There is a strong emphasis on hands-on skills, including building links across scientific, social and business sectors environmental analysis, effective communication and project management. The course structure is based on a limited number of core subjects which provide a solid foundation to understanding of the biology, ecology and sustainable management of the Australian landscape, supplemented by a wide range of electives drawn from the environmental engineering, business, tourism, community development and human bioscience disciplines. Students can choose from electives according to the four major streams in the course: a) ecology and natural resource management (with specialisations in aquatic engineering and environmental engineering); b) ecology and community development; c) ecology and tourism/business; d) ecology and human bioscience/wellness. These are suggested streams only and students may select electives according to their desired academic and career pathway, subject to approval from the Course Coordinator. The course teaches students the necessary skills to perform a wide range of activities in ecology and environmental science in addition to environmental issues and community studies,provides the skills for communicating their ecological knowledge to science professionals and the general community. The course structure is practically based and flexible, allowing a mix of in-depth studies and specialisations in novel combinations of subjects across a wide range of disciplines.

Careers: Careers in ecology and sustainability include: landcare/bushcare coordinator; environment officer or environmental planner; restoration ecology and land management officer; marine and freshwater ecosystem management officer; environmental educator; botanist/zoologist/ecologist and ecological and resource assessor.

Course Duration:3 years

Admission Requirements Year 12: The minimum entry requirement for persons under 21 years of age on 1 January 2005 is the satisfactory completion of a Year 12 course of study approved by the Victorian Curriculum and Assessment Board (VCAB) or an equivalent program approved by Victoria University for entry.The minimum ENTER score for 2005 is 70. Prerequisites are Units 3 and 4 - a study score of at least 20 in English (any).There is also provision for mature age entry and entry as a disadvantaged person. Mature age provisions apply to those persons aged 21 years and over as at 1 January 2006.

COURSE STRUCTURE

The Bachelor of Science in Ecology and Sustainability program requires the equivalent of three years full-time study. A fourth year may be taken in the Honours program.

Year 1, Semester 1

ACE1911	COMMUNICATIONS FOR THE PROF SCIENTIST 1	12
RBF1310	BIOLOGY 1	12
RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12

or

RCS1110	CHEMISTRY FOR BIOLOGICAL SCIENCES A	12
RMA1110	MATHEMATICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 1	12

or elective

Year 1, Semester 2

ACE1912	COMMUNICATIONS FOR THE PROF SCIENTIST 2	12
RBF1320	BIOLOGY 2	12
RBF1160	AUSTRALIAN LANDSCAPES AND BIOTA	12

and/or

RCS1120	CHEMISTRY FOR BIOLOGICAL SCIENCES B	12

and/or

RMA1120	STATISTICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 2	12

and/or elective

Year 2, Semester 1

RBF2610	FUNDAMENTALS OF ECOLOGY	12
RBF2640	AUSTRALIAN ANIMALS	12

and/or

RCS1120	CHEMISTRY FOR BIOLOGICAL SCIENCES B	12

and/or

RMA1110	MATHEMATICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 1	12

and/or elective

Year 2, Semester 2

RBF2630	COMMUNITY AND ENVIRONMENT	12
RBF2620	AUSTRALIAN PLANTS	12

and/or

RCS1120	CHEMISTRY FOR BIOLOGICAL SCIENCES B	12

and/or

RMA1120	STATISTICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 2	12

and/or elective

Prescribed and free electives

Year 3, Semester 1

Minimum of four from list below plus up to four electives

RBF3110	MARINE & FRESHWATER ECOLOGY	12
RBF3610	BIOSTATISTICS	12
RBF3620	CONSERVATION AND SUSTAINABILITY	12
RBM3101	GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR CONSERVATION & HEALTH	12

Year 3, Semester 2

RBF3630	ENVIRONMENTAL IMPACTS AND MONITORING	12
RBF3210	ENVIRONMENTAL REHABILITATION	12
RBF3650	POLLUTION BIOLOGY	12

RBF3660	INDIGENOUS SOCIETY AND ENVIRONMENTAL MANAGEMENT	12

Electives 3

1. Students taking the Ecology and Human Bioscience/Wellness stream can take RBF1310 Biology 1 or RBF1510 Human Bioscience 1A

2. Students enrolled in the Natural Resource Management stream would be advised to take RCS1110 Chemistry for Biological Sciences A and RCS1120 Chemistry for Biological Sciences B, as these Units of Study are prerequisites for some level 2 and 3 core units in that stream. Students in other streams would not be so advised.

Students enrolled in the Natural Resource Management stream would be required to take RMA1110 Mathematics for the Biological & Chemical Sciences 1 and RMA1120 Mathematics for the Biological & Chemical Sciences 2 if they lack VCE Mathematics, but could take an elective if they have VCE Mathematics. This is at the discretion of the Course Coordinator.

Students taking either of the Engineering specialisations within the Natural Resource Management stream should take RMA1110 Mathematics for the Biological & Chemical Sciences 1 and RMA1120 Mathematics for the Biological & Chemical Sciences 2 in the first year of study. All other students within the stream should take these units in their second year.

3. Prescribed and free electives are those listed below.

Electives

At least 6 electives are required to be taken over the course of the degree. Electives other than those listed below may be taken at the discretion of the Course Co-ordinator. The total credit points must be within the prescribed range and due consideration must be given for prerequisites.

Science electives may be chosen from any of the degree units offered by the College of Engineering and Science. Units from programs offered by other Collleges may also be selected as elective subjects, subject to the approval of the appropriate College. Students should refer to the unit outlines listed within other Schools and Faculties for further information.

Students are advised to seek the assistance of academic staff when making their elective choice, as the judicious selection of electives can provide an opportunity to undertake a second major study alongside the primary degree specialisation.

Prescribed Electives

Ecology and Natural Resource Management Stream

RCS1110	CHEMISTRY FOR BIOLOGICAL SCIENCES A	12
RMA1110	MATHEMATICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 1	12
RCS1120	CHEMISTRY FOR BIOLOGICAL SCIENCES B	12
RMA1120	STATISTICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 2	12

These Units of Study are recommended.

Aquatic Engineering and Environmental Engineering Specialisations

It is possible to undertake a number of units in Aquatic Engineering and Environmental Engineering Specialisations. Please discuss with the Course Coordinator prior to selection.

Ecology and community Development Stream

ASA1023	COMMUNITY DEVELOPMENT FROM THE LOCAL TO THE GLOBAL	12
ASA1024	APPLIED HUMAN RIGHTS	12
ASA2024	SOCIAL MOVEMENTS, SOCIAL ACTIONS	12
ASC3095	CONFLICT RESOLUTION IN GROUPS AND COMMUNITIES	12

Ecology and Tourism/Business Stream

BHO1190	INTRODUCTION TO TOURISM	12
BHO2286	NATURE BASED TOURISM	12

Students taking this stream should choose two electives from the following:

BHO2255	TOURISM ENTERPRISE MANAGEMENT	12
BHO1193	TOURISM PRODUCT DESIGN AND DELIVERY	12
BHO3499	MANAGING SUSTAINABLE DESTINATIONS	12
BHO3500	HOSPITALITY AND TOURISM INDUSTRY PROJECT	12
BHO1171	INTRODUCTION TO MARKETING	12
BAO1101	ACCOUNTING FOR DECISION MAKING	12

Ecology and Human Bioscience/Wellness Stream

RBM2530	PATHOPHYSIOLOGY 1	12
RBM2540	PATHOPHYSIOLOGY 2	12
RBM3810	WELLNESS 1	12
RBM3820	WELLNESS 2	12

Students taking this stream could include electives from the following:

RBM2260	DIET AND NUTRITION	12
RBM2560	MEDICAL BIOCHEMISTRY	12
RBM2610	BIOMEDICAL SCIENCES AND SOCIETY	12
RBM1514	FUNCTIONAL ANATOMY 1	12
RBM1524	FUNCTIONAL ANATOMY 2	12

RBM2361	SAFETY PRACTICE	12

Suitable Free Electives

Some electives may be prescribed for certain streams

RCS1110	CHEMISTRY FOR BIOLOGICAL SCIENCES A	12
RMA1110	MATHEMATICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 1	12
RCS1120	CHEMISTRY FOR BIOLOGICAL SCIENCES B	12
RMA1120	STATISTICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 2	12
ASC3095	CONFLICT RESOLUTION IN GROUPS AND COMMUNITIES	12
BAO1101	ACCOUNTING FOR DECISION MAKING	12
BHO1171	INTRODUCTION TO MARKETING	12
BHO1190	INTRODUCTION TO TOURISM	12
BHO2255	TOURISM ENTERPRISE MANAGEMENT	12
BHO2286	NATURE BASED TOURISM	12
BHO3500	HOSPITALITY AND TOURISM INDUSTRY PROJECT	12
RBM1514	FUNCTIONAL ANATOMY 1	12
RBM1524	FUNCTIONAL ANATOMY 2	12
RBM2201	CONSERVATION GENETICS	12
RBM2260	DIET AND NUTRITION	12
RBM2361	SAFETY PRACTICE	12
RBM2530	PATHOPHYSIOLOGY 1	12
RBM2540	PATHOPHYSIOLOGY 2	12
RBM2560	MEDICAL BIOCHEMISTRY	12
RBM2610	BIOMEDICAL SCIENCES AND SOCIETY	12
RBM3101	GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR CONSERVATION & HEALTH	12
RBM3810	WELLNESS 1	12
RBM3820	WELLNESS 2	12
RBF3530	ENVIRONMENTAL PHILOSOPHY	12
RBF3540	LEADERSHIP AND THE ENVIRONMENT	12

Other Course Specific Notes Students are advised to seek assistance and advice of academic staff when making their elective selection. Engineering and Tourism/Business units are offered only on the Footscray Park Campus in the first instance. Timetable constraints make combinations of units offered on more than one Campus difficult and so must be selected with care. Field trips Students will be required to participate in field trips throughout the course. These will vary from one-day excursions to three-day field camps. Some field trips may be held over weekends. Participation in these activities forms part of the required assessment of the units, and provides essential experience in field techniques. Exemption from these activities is available only by prior application to the Course Co-ordinator where circumstances preclude participation. Professional Recognition Graduates of the course are eligible to join professional and learned societies such as the Ecological Society of Australia and the Australian Institute of Biologists.

BACHELOR OF SCIENCE (SPECIALISATION)

Course Code:SBGG
Campus: Werribee, Footscray Park, St Albans.
This course is for Continuing students only.

Course Objectives: Graduates from this course should be able to:

- locate, manage and use scientific information efficiently and effectively;
- solve scientific problems effectively in a range of settings including industry and community;
- exhibit high levels of numeracy skills in a range of scientific settings;
- communicate effectively in spoken and written forms on a range of scientific and mathematical topics to professional and community groups;
- apply an evidence-based research approach to a chosen area of science;
- respond with social and cultural awareness within local and global environments; and
- work autonomously and collaboratively as a professional in both industry and community settings.

Course Duration:3 years

Admission Requirements Year 12: To qualify for admission to the course, applicants must have: Science -Specialisation pre-requisites: Units 3 and 4, a study score of at least 25 in English (any) and in mathematics (any). Middle band: Completing biology, chemistry, food and technology, physics or specialist mathematics = an aggregate 3 points higher per study, to a maximum of 9 points. Education -Science Education pre-requisites: Units 3 and 4, a study score of at least 25 in English (any) and in mathematics (any). Alternative entry Applicants who do not meet the normal admission requirements but who possess appropriate educational qualifications, work or life experiences that would enable them to successfully undertake the course, will be considered for admission. Persons of Aboriginal or Torres Strait Islander descent are encouraged to apply for admission. Applicants will be assessed on an individual basis to determine their suitability and potential for success in the course. Applicants over the age of 21 years on the 1st January for the commencing academic year are eligible to apply for consideration under Mature Age entry. Applicants who consider that their capacity to qualify under normal entry provisions has been limited through disadvantage, for example, illness, disability, financial hardship or isolation, are eligible to apply for consideration as a disadvantaged person. Applicants will be assessed on an individual basis to determine their suitability and potential for success in the course. Students who successfully complete the VU alternative entry or foundations studies courses will be offered access into the SBGG degree.

Admission Requirements Other: Interview (some applicants only).Successful applicants will require a Working with Children Check.Students must complete a Working with Children Check prior to undertaking teaching placements.

COURSE STRUCTURE

Biotechnology

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RBF1310	BIOLOGY 1	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12
RCS1601	CHEMISTRY 1A	12

Year 1, Semester 2

RBF1320	BIOLOGY 2	12
RCM1613	APPLIED STATISTICS 1	12
RCS1602	CHEMISTRY 1B	12

Plus one elective

Chemistry

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RBF1310	BIOLOGY 1	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12
RCS1601	CHEMISTRY 1A	12

Year 1, Semester 2

RBF1320	BIOLOGY 2	12
RCM1613	APPLIED STATISTICS 1	12
RCS1602	CHEMISTRY 1B	12

Plus one elective

Community Science

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
SED1101	COMMUNITY BASED GENERAL SCIENCE 1	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12

Plus one elective

Year 1, Semester 2

RCM1712	MATHEMATICAL FOUNDATIONS 2	12
SED1202	COMMUNITY BASED GENERAL SCIENCE 2	12

Plus two electives

Computing

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RCM1114	INTRODUCTION TO COMPUTING AND THE INTERNET	12
RCM1311	PROGRAMMING 1	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12

Year 1, Semester 2

RCM1312	PROGRAMMING 2	12
RCM1613	APPLIED STATISTICS 1	12

Plus two electives

Ecology & Environmental Management

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RBF1310	BIOLOGY 1	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12
RCS1601	CHEMISTRY 1A	12

Year 1, Semester 2

RBF1320	BIOLOGY 2	12
RCM1613	APPLIED STATISTICS 1	12
RCS1602	CHEMISTRY 1B	12

Plus one elective

Food Science

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RBF1310	BIOLOGY 1	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12
RCS1601	CHEMISTRY 1A	12

Year 1, Semester 2

RBF1140	INTRODUCTION TO FOOD, NUTRITION AND HEALTH 1	12
RCM1613	APPLIED STATISTICS 1	12
RCS1602	CHEMISTRY 1B	12

Plus one elective

Maths

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RCM1613	APPLIED STATISTICS 1	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12

Plus one elective

Year 1, Semester 2

RCM1614	APPLIED STATISTICS 2	12
RCM1712	MATHEMATICAL FOUNDATIONS 2	12

Plus two electives

Safety

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RBF1310	BIOLOGY 1	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12
RCS1601	CHEMISTRY 1A	12

Year 1, Semester 2

RBF1320	BIOLOGY 2	12
RCM1613	APPLIED STATISTICS 1	12
RCS1602	CHEMISTRY 1B	12

Plus one elective

Physics

Year 1, Semester 1

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12
REP1001	ENGINEERING PHYSICS 1A	12
VEF1003	ELECTRICAL FUNDAMENTALS 1A	12

Year 1, Semester 2

RCM1712	MATHEMATICAL FOUNDATIONS 2	12
RCM1613	APPLIED STATISTICS 1	12
REP1002	ENGINEERING PHYSICS 1B	12
VEF1004	ELECTRICAL FUNDAMENTALS 1B	12

Biotechnology

Year 2, Semester 1

RBF2300	MICROBIOLOGY 1	12
RBF2520	BIOCHEMISTRY 1	12

Plus two electives

Year 2, Semester 2

RBF2330	CELL BIOLOGY	12
RBF2390	MOLECULAR GENETICS	12

Plus two electives

Chemistry

Year 2, Semester 1

RCS2100	ORGANIC CHEMISTRY 2A	12
RCS2601	ANALYTICAL CHEMISTRY 2A	12

Plus two electives

Year 2, Semester 2

RCS2503	FORENSIC CHEMISTRY 2	12
RCS2602	ANALYTICAL CHEMISTRY 2B	12

Plus two electives

Community Science

Year 2, Semester 1

RCM1613	APPLIED STATISTICS 1	12
SED2103	COMMUNITY BASED GENERAL SCIENCE 3	12

Plus two electives

Year 2, Semester 2

SED2204	COMMUNITY BASED GENERAL SCIENCE 4	12

RBF2620	AUSTRALIAN PLANTS	12
RCM1614	APPLIED STATISTICS 2	12

Plus one elective

Computing

Year 2, Semester 1

RCM1211	DATABASE SYSTEMS 1	12
RCM2111	DATA COMMUNICATIONS AND NETWORKS 1	12

Plus two electives

Year 2, Semester 2

RCM2312	SOFTWARE ENGINEERING 1	12
RCM2313	SOFTWARE DEVELOPMENT	12

Plus two electives

Ecology & Environmental Management

Year 2, Semester 1

RBF2610	FUNDAMENTALS OF ECOLOGY	12
RBF2640	AUSTRALIAN ANIMALS	12

Plus two electives

Year 2, Semester 2

RBF2620	AUSTRALIAN PLANTS	12
RBF2630	COMMUNITY AND ENVIRONMENT	12

Plus two electives

Food Science

Year 2, Semester 1

RBF2141	FOOD COMPONENTS AND INTERACTIONS	
RBF3730	FOOD MICROBIOLOGY	12

Plus two electives

Year 2, Semester 2

RBF2242	FOOD PRESERVATION	12
RBF2243	FOOD PROCESSING OPERATIONS	

Plus two electives

Maths

Year 2, Semester 1

RCM2101 - to be advised

RCM2612	FORECASTING	12

Plus two electives

Year 2, Semester 2

RCM2611	LINEAR STATISTICAL MODELS	12
RCM2911	LINEAR OPTIMISATION MODELLING	12

Plus two electives

Safety

Year 2, Semester 1

SAF2101	SAFETY	
SAF2102	SAFETY, HEALTH AND WELLNESS	

Plus two electives

Year 2, Semester 2

SAF2203	RISK ASSESSMENT	
SAF2204	SAFETY PRACTICE	

Physics

Year 2, Semester 1

REP2001 to be advised.

VEF2001	LINEAR SYSTEMS AND MATHEMATICS 2A	12

Plus two electives

Year 2, Semester 2

RCM3721 to be advised.

REP2002 to be advised.

VEF2002	SYSTEMS AND MATHEMATICS 2B	12

Plus one elective

Pre-requisite for all Streams: Successful completion of years one and two SBGG

Biotechnology

Year 3, Semester 1

RIP3000 to be advised.

RMS3030	GENETIC ENGINEERING	12

Plus two electives

Year 3, Semester 2

RMS3020	GENOMICS, PROTEOMICS AND BIOINFORMATICS	12
RMS3050	ADVANCED MEDICAL MICROBIOLOGY	6
RMS3060	MICROBIAL TECHNOLOGY AND CELL CULTURE	6

Plus two electives

Chemistry

Year 3, Semester 1

RCS3601	ANALYTICAL CHEMISTRY 3A	12
RCS3605	FORENSIC METHODS 3A	12

Plus two electives

Year 3, Semester 2

RCS3602	ANALYTICAL CHEMISTRY 3B	12

RIP3000 to be advised

Plus two electives

Community Science

Year 3, Semester 1

RPH1111	ASTRONOMY	12
SED3105	COMMUNITY BASED GENERAL SCIENCE 5	12

Plus two electives

Year 3, Semester 2

RIP3000 to be advised

SED3206	COMMUNITY BASED GENERAL SCIENCE 6	12

Plus two electives

Computing

Year 3, Semester 1

RCM2112	OPERATING SYSTEMS	12

RIP3000 to be advised

Plus two electives

Year 3, Semester 2

RCM3002	PROJECT 2	12
RCM3820	INTERNET COMPUTING USING XML	12

Plus two electives

Ecology & Environmental Management

Year 3, Semester 1

RBM3101	GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR CONSERVATION & HEALTH	12

RBF3110 to be advised

Plus two electives

Year 3, Semester 2

RBF3210	ENVIRONMENTAL REHABILITATION	12

RIP3000 to be advised

Plus two electives

Food Science

Year 3, Semester 1

RBF3143 to be advised.

RBF2210	NUTRITION AND FOOD ANALYSIS 1	12

Plus two electives

Year 3, Semester 2

RBF3244

RIP3000

Plus two electives

Maths

Year 3, Semester 1

RCM3711	COMPUTATIONAL METHODS	12

Plus three electives

Year 3, Semester 2

RCM3721

RIP3000

Plus two electives

Safety

Year 3, Semester 1

SAF3105	SAFETY SCIENCE	
SAF3106	SAFETY HUMAN FACTORS	

Plus two electives

Year 3, Semester 2

REP3000

SAF3107 RISK MANAGEMENT

Plus two electives

Physics

Year 3, Semester 1

REP3001

Plus three electives

Year 3, Semester 2

REP3002

RIP3000

Plus two electives

Electives: Students are not restricted in their choice of electives and will be encouraged to select from other streams.

Biochemistry

RBF2530	BIOCHEMISTRY 2	12
RMS3010	BIOPROCESSING APPLICATIONS	12
RMS3045	PROJECT 2 - BIOTECHNOLOGY	12
RMS3113	COMPARATIVE IMMUNOBIOLOGY	12

Chemistry

RCS2200	ORGANIC CHEMISTRY 2B	12
RCS2502	MEDICAL CHEMISTRY 2	12
RCS3603	MEDICAL CHEMISTRY 3 A	12
RCS3XXX		

Community Science

RBF2922	SCIENCE AND SOCIETY	12

Computing

RCM2316	NETWORK OPERATING SYSTEM ADMINISTRATION	12
RCM3112	USER INTERFACE DESIGN	12
RCM3312	INTELLIGENT SYSTEMS	12
RCM3960	INTERNET SECURITY	12

Ecology & Environmental Management

RBF1160	AUSTRALIAN LANDSCAPES AND BIOTA	12
RBF3620	CONSERVATION AND SUSTAINABILITY	12
RBF3610	BIOSTATISTICS	12
RBF3630	ENVIRONMENTAL IMPACTS AND MONITORING	12
RBF3650	POLLUTION BIOLOGY	12
RBM2201	CONSERVATION GENETICS	12

Food Science

RBF3230	ANIMAL FOOD PROCESSING	6
RBF3235	PLANT FOOD PROCESSING	6
RBF3240	FUNCTIONAL FOODS	12
RBF3255	PRODUCT DEVELOPMENT	6
RBFXXXX		
RBFXXXX		
RBFXXXX		
RBFXXXX		

Maths

RCM2614	STATISTICAL DATAMINING	12
RCM2915	STOCHASTIC AND COMBINATORIAL OPTIMISATION	12
RCM3413	FINANCIAL MODELLING	12
RCM3720	CRYPTOGRAPHY, COMPUTER AND NETWORK SECURITY	12

Safety

ASS3009	SOCIOLOGY OF LAW	12
BLO1105	BUSINESS LAW	12
BLO2233	HEALTH AND SAFETY LAW	12
BMO1102	MANAGEMENT AND ORGANISATION BEHAVIOUR	12
BMO3351	WORKPLACE INDUSTRIAL RELATIONS	12
BMO3476	TRAINING AND DEVELOPMENT	12

Physics

REP4100	DATA ACQUISITION	12
REP4300	EINSTEIN'S THEORY OF RELATIVITY	6
RPH1111	ASTRONOMY	12
VEF2003	SYSTEMS AND APPLICATIONS 2C	12
VEF2004	SYSTEMS & APPLICATIONS 2D	12
VEG4100	DIGITAL SIGNAL PROCESSING A	6
VEP3001	PHOTONICS	6
VEP3002	PHOTONICS 2	6

BACHELOR OF INFORMATION TECHNOLOGY (NETWORK AND SYSTEMS COMPUTING)

Course Code:SBNS
Campus: Footscray Park.

About this course: The Bachelor of Information Technology (Network and Systems Computing) is a forward-looking course in the area of networks and systems. It is current, relevant and will prepare students for IT industry certifications in the fields of networking, databases, and systems administration. The course will equip students with the skills and support required to gain an entry level position within the IT industry, filling a growing market need for graduates skilled in systems administration with networking expertise.

Course Objectives: The degree is designed to produce graduates who will have a strong industry focus gained through relevant workplace experience in the program combined with an industry capstone project in the final year. The degree will: provide a solid foundation in information technology skills and knowledge that can be applied across a wide range of applications; provide an infrastructure through which students can gain technical, analytical, and managerial knowledge and interpersonal skills, and develop skills and abilities important for effective participation and leadership in industry; emphasise a hands-on approach to learning and create real-world learning experiences with a strong industry focus; facilitate preparation for industry certifications from large reputable vendors both locally and overseas; offer a solid preparation for different careers in the field of network and systems computing in sectors including government, banking and finance, retail, and manufacturing; engage students in lifelong learning and professional development activities that will equip the students as graduates with a competitive edge in their chosen career paths.

Careers: Completion of the course will prepare graduates for roles such as computing and network support, web-based programming, networking and systems administration, system security consultancy, database administration, I.T. business analysis, and project management in sectors including government, banking and finance, retail, and manufacturing.

Course Duration:3 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in a mathematics (any). Persons transferring from other courses or having overseas or other entrance qualifications of at least equivalent standard should apply for admission in the normal manner.

Admission Requirements International: Full-fee paying international students must have qualifications which are equivalent to those listed above. In addition, they must provide evidence of proficiency in the English language: Achieve an IELTS (Academic Module) result with an overall score of 6+ (no band less than 6) or equivalent.

Admission Requirements Mature Age: Qualifications of at least equivalent standard to Victorian Certificate of Education and appropriate life experiences for mature age students.

Admission Requirements VET: Completion of an appropriate Information Technology TAFE program.

COURSE STRUCTURE

The Course is offered over 3 years (6 semesters) on full time basis and equivalent part time. To qualify for the award of BIT (Network and Systems Computing) a total of 288 credit points should be completed.

Year 1, Semester 1

ECB1111	INTRODUCTION TO COMPUTER SYSTEMS	12
ECB1121	PROGRAMMING PRINCIPLES	12
ECB1131	COMPUTER NETWORK CONCEPTS	12

And

one elective unit as listed below or any 12 credit-point unit within the University approved by the Course Coordinator.

ECB1151	COMMUNICATION AND INFORMATION MANAGEMENT	12

Year 1, Semester 2

ECB1222	WEB DESIGN AND PROGRAMMING	12
ECB1223	INTRODUCTION TO SYSTEMS ANALYSIS AND DATABASES	12
ECB1213	COMPUTER OPERATING SYSTEMS	12
ECB1252	INTRODUCTION TO THE COMPUTING PROFESSION	12

Year 2, Semester 1

ECB2112	SECURITY, PRIVACY AND ETHICS	12
ECB2132	INTERNETWORKING TECHNOLOGIES	12
ECB2123	PROGRAMMING FOR NETWORKS	12
ECB2124	WEB-BASED SYSTEMS DEVELOPMENT	12

Year 2, Semester 2

ECB2225	MULTI-USER DATABASE SYSTEMS	12

ECB2234	NETWORK SECURITY	12
ECB2241	WIRELESS NETWORKS	12
ECB2253	IT PROJECT MANAGEMENT	12

Year 3, Semester 1

ECB3135	SERVER ADMINISTRATION AND MAINTENANCE	12
ECB3142	ACTIVE DIRECTORY DESIGN AND MANAGEMENT	12
ECB3143	NETWORK MANAGEMENT	12
ECB3154	COMPUTING PROJECT ANALYSIS AND DESIGN	12

Year 3, Semester 2

ECB3214	VIRTUALISATION IN COMPUTING	12
ECB3244	ADVANCED NETWORK TECHNOLOGIES	12
ECB3255	SMALL IT BUSINESS DEVELOPMENT	12
ECB3256	COMPUTING PROJECT DEVELOPMENT AND IMPLEMENTATION	12

BACHELOR OF SCIENCE (SPECIALISATIONS IN BIOTECHNOLOGY, CHEMISTRY OR ENVIRONMENTAL MANAGEMENT)

Course Code:SBSC

Campus: Werribee, Footscray Park, Year 1: Footscray Park campus. Year 2 & 3: Werribee campus.

About this course: The Bachelor of Science (Specialisations in Biotechnology, Chemistry or Environmental Management) course offers specialisations in the three science disciplines listed below:

- Biotechnology
- Chemistry
- Ecology & Environmental Management

Students can choose to specialise in one or two of these science disciplines. This is a three year course with a common first year and a choice of sub-specialisations in the latter two years that allows students the flexibility to add other studies of interest to their specialisation. Sub-specialisations can be chosen from health, engineering, science, arts, business and law. Sub-specialisations are subject to the approval of the course coordinator and may be limited by prerequisite requirements and timetable clashes. Science sub-specialisations are listed below.

- analytical chemistry
- cell biology/microbiology
- community science
- computing
- environmental science
- environmental assessment & analysis
- forensic chemistry
- mathematics/statistics
- molecular biology.

The BSc (Specialisations in Biotechnology, Chemistry or Environmental Management) is industry focused, offers an intensive hands-on laboratory and fieldwork experience, has modern laboratories with state-of-the-art equipment, provides opportunities for industry projects and placements and overall better prepares students for careers in the science profession. Those students with scientific research in mind can progress into Honours and postgraduate studies (subject to performance in the degree program). Biotechnology Specialisation Biotechnology involves the use of biological cells and their components for the benefit of society. It includes the application of the latest technologies to solve medical, environmental and agricultural problems. The biotechnology specialisation prepares students for exciting careers in cutting edge science. It provides in-depth education in many areas of modern biology including genetic engineering, medical research, cloning, forensic biology, environmental biotechnology, microbiology and biochemistry. There is a strong emphasis on the development of laboratory-based skills for which the university is equipped with state-of-the-art facilities. Chemistry Specialisation The chemistry specialisation has a strong industry focus and will produce graduates that are 'work ready' by combining an extensive laboratory program with training on state-of-the-art equipment along with an industry placement program. The course combines studies in analytical, forensic and organic chemistry to develop measurement and investigative skills that are highly sought after by industry. After completing second year, students have the opportunity to work in one of over twenty chemical industries as part of their studies. The laboratory program includes hands-on training in modern analytical techniques including atomic absorption spectroscopy, inductively coupled plasma optical emission spectroscopy, gas chromatography including gas chromatography-mass spectrometry, liquid chromatography including liquid chromatography-mass spectrometry, ion chromatography, ultraviolet and visible spectroscopy, fluorescence spectroscopy and Fourier transform infra-red spectroscopy. Over a million dollars of state-of-the-art analytical equipment has recently been acquired and extensive training on this equipment including applications, theory of operation, optimisation, maintenance and troubleshooting forms a major part of second and third year studies. The laboratory program is designed to give our chemistry graduates a genuine head start into the work force. Ecology & Environmental Management Specialisation Australia and the rest of the world face significant challenges in balancing the needs of a sustainable society while protecting the natural environment. The Ecology and Environmental Management specialisation develops skills in environmental sciences that underpin achievable sustainability strategies. Subjects combine extensive practical experience in the field (terrestrial, marine and freshwater environments) and laboratory, with theory that is based on current research and management practices. In partnership with industry, government agencies, researchers and the community, this specialisation produces graduates that are 'work-ready'. An emphasis on environmental research methodology across all subjects also leads to a high uptake into more highly specialised honours and postgraduate research projects. The Ecology and Environmental Management specialisation develops the knowledge and practical experience for working across social, environmental and economic contexts, to achieve ecological sustainability. Pathways to a Career in Teaching The BSc (Specialisations in Biotechnology, Chemistry or Environmental Management) offers a selection of units in mathematics and science, including six new innovative community science units, which prepare students wishing to pursue careers as maths/science teachers. The community science units are unique and emphasise learning in the workplace through placements in primary and secondary schools and in community education groups. To qualify for teaching in secondary schools graduates from the BSc (Specialisations in Biotechnology, Chemistry or

Environmental Management) must apply for and complete the Graduate Diploma in Secondary Education.

Course Objectives: The Bachelor of Science (Specialisations in Biotechnology, Chemistry or Environmental Management) will produce graduates with a thorough knowledge of contemporary science for careers in industry, government and education. The selection of specialisations and sub-specialisations offered allows students the flexibility to customise their learning towards current and future career demands. Via various learning in the workplace and community strategies the course will make graduates 'work ready'. The course allows students wishing to pursue maths/science teaching via the Graduate Diploma in Secondary Education, a number of possibilities with respect to obtaining parts, sub-majors and majors in maths/science teaching specialist areas. Graduates from this course should be able to:

- locate, manage and use scientific information efficiently and effectively
- solve scientific problems effectively in a range of settings including industry and community
- exhibit high levels of numeracy skills in a range of scientific settings
- communicate effectively in spoken and written forms on a range of scientific and mathematical topics to professional and community groups
- apply an evidence-based research approach to a chosen area of science
- respond with social and cultural awareness within local and global environments
- work autonomously and collaboratively as a professional in both industry and community settings.

Careers: The Bachelor of Science (Specialisations in Biotechnology, Chemistry or Environmental Management) will produce graduates with a thorough knowledge of contemporary science for careers in industry, government and education. The flexibility of the course allows students to customise their learning towards current and future career demands. Biotechnology graduates pursue careers in a variety of areas including medical and pharmaceutical research, forensic science, agriculture and aquaculture, the food and beverage industry and education. Industries that employ our chemistry graduates include: agricultural chemicals, brewing and wine, chemical analysis, cosmetics, dairy, environmental science and water, food, forensics, horticulture, industrial chemicals, materials and polymers, petrochemicals, pharmaceutical, scientific sales, state and federal government departments. Careers in ecology and environmental management include: landcare/bushcare coordinator; environment officer or environmental planner; restoration ecology and land management officer; marine and freshwater ecosystem management officer; environmental educator; botanist/zoologist/ecologist and ecological and resource assessor. The course has been designed in collaboration with the College of Education and the science units offered provides pathways for students to pursue maths/science teaching. To qualify for teaching in secondary schools graduates from the BSc (Specialisations in Biotechnology, Chemistry or Environmental Management) must apply for and complete the Graduate Diploma in Secondary Education.

Course Duration:3 years

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English AND in a mathematics (any).

Admission Requirements Other: Community science units of study include placements within schools and other community settings. Police check: Students may be required to complete a National Police Record Check prior to undertaking Community Science units of study. Working with Children Check: Students must complete a Working with Children Check prior to undertaking Community Science units of study.

COURSE STRUCTURE

To graduate with the SBSC Bachelor of Science (Specialisations in Biotechnology, Chemistry or Environmental Management) students must satisfy the following conditions:

- Successfully complete units of study totalling at least 288 credit points.
- A minimum of 240 credit points in approved units must be taken from the College of Engineering and Science.
- A maximum of 48 credit points in approved units can be taken from either the College of Arts or the College of Business.
- Successfully complete either of the following specialisation and sub-specialisation combinations.

Common Year 1 96 credit points + Specialisation 96 credit points + Specialisation 96 credit points or Common Year 1 96 credit points + Specialisation 96 credit points + Sub-specialisation 48 credit points + Sub-specialisation 48 credit points

- Units of study at the third year level totalling at least 48 credit points.
- Successfully complete in Year 3 the compulsory unit of study RSS3000 INDUSTRY PROJECT (12 credit points) taken in a chosen specialisation.

Semester One

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RBF1310	BIOLOGY 1	12
RCS1601	CHEMISTRY 1A	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12

Semester Two

RBF1320	BIOLOGY 2	12
RCM1114	INTRODUCTION TO COMPUTING AND THE INTERNET	12
RCS1602	CHEMISTRY 1B	12
RCM1613	APPLIED STATISTICS 1	12

List A: Specialisations

Biotechnology Specialisation

Year 2

Semester One

RBF2300	MICROBIOLOGY 1	12
RBF2520	BIOCHEMISTRY 1	12

Choose Year 2 sem 1 units of another Specialisation from List A

OR

Choose Year 2 sem 1 units of two Sub-specialisations from List B

Semester Two

RBF2330	CELL BIOLOGY	12
RBF2390	MOLECULAR GENETICS	12

Choose Year 2 sem 2 units of another Specialisation from List A

OR

Choose Year 2 sem 2 units of two Sub-specialisations from List B

Year 3

Choose RSS3000 Industry Project in one Specialisation in consultation with the Course Coordinator.

RSS3000	INDUSTRY PROJECT	12

Choose other units to the value of 36 credit points in semesters 1 and 2 from that Specialisation in consultation with the Course Coordinator.

Semester One

RMS3030	GENETIC ENGINEERING	12
RMS3113	COMPARATIVE IMMUNOBIOLOGY	12

Choose Year 3 sem 1 units of another Specialisation from List A

OR

Choose Year 3 sem 1 units of two Sub-specialisations from List B

Semester Two

RMS3010	BIOPROCESSING APPLICATIONS	12
RMS3020	GENOMICS, PROTEOMICS AND BIOINFORMATICS	12

Choose Year 3 sem 2 units of another Specialisation from List A

OR

Choose Year 3 sem 2 units of two Sub-specialisations from List B

Chemistry Specialisation

Year 2

Semester One

RCS2100	ORGANIC CHEMISTRY 2A	12
RCS2601	ANALYTICAL CHEMISTRY 2A	12

Choose Year 2 sem 1 units of another Specialisation from List A

OR

Choose Year 2 sem 1units of two Sub-specialisations from List B

Semester Two

RCS2503	FORENSIC CHEMISTRY 2	12
RCS2602	ANALYTICAL CHEMISTRY 2B	12

Choose Year 2 sem 2 units of another Specialisation from List A

OR

Choose Year 2 sem 2 units of two Sub-specialisations from List B

Year 3

Choose RSS3000 Industry Project in one Specialisation in consultation with the Course Coordinator.

RSS3000	INDUSTRY PROJECT	12

Choose other units to the value of 36 credit points in semesters 1 and 2 from that Specialisation in consultation with the Course Coordinator.

Semester One

RCS3601	ANALYTICAL CHEMISTRY 3A	12
RCS3605	FORENSIC METHODS 3A	12

Choose Year 3 sem 1 units of another Specialisation from List A

OR

Choose Year 3 sem 1 units of two Sub-specialisations from List B

Semester Two

RCS3602	ANALYTICAL CHEMISTRY 3B	12
RSS3000	INDUSTRY PROJECT	12

Choose Year 3 sem 2 units of another Specialisation from List A

OR

Choose Year 3 sem 2 units of two Sub-specialisations from List B

Ecology & Environmental Management Specialisation

Year 2

Semester One

RBF1160	AUSTRALIAN LANDSCAPES AND BIOTA	12
RBF2640	AUSTRALIAN ANIMALS	12

Choose Year 2 sem 1 units of another Specialisation from List A

OR

Choose Year 2 sem 1 units of two Sub-specialisations from List B

Semester Two

RBF2610	FUNDAMENTALS OF ECOLOGY	12
RBF2620	AUSTRALIAN PLANTS	12

Choose Year 2 sem 2 units of another Specialisation from List A

OR

Choose Year 2 sem 2 units of two Sub-specialisation from List B

Year 3

Choose RSS3000 Industry Project in one Specialisation in consultation with the Course Coordinator.

RSS3000	INDUSTRY PROJECT	12

Choose other units to the value of 36 credit points in semesters 1 and 2 from that Specialisation in consultation with the Course Coordinator.

Semester One

RBF3110	MARINE & FRESHWATER ECOLOGY	12
RBF3620	CONSERVATION AND SUSTAINABILITY	12

Choose Year 3 sem 1 units of another Specialisation from List A

OR

Choose Year 3 sem 1 units of two Sub-specialisations from List B

Semester Two

RBF3210	ENVIRONMENTAL REHABILITATION	12
RBM2201	CONSERVATION GENETICS	12

Choose Year 3 sem 2 units of another Specialisation from List A

OR

Choose Year 3 sem 2 units of two Sub-specialisations from List B

List B: *Sub-specialisations

Molecular Biology

Year 2

RBF2520	BIOCHEMISTRY 1	12
RBF2390	MOLECULAR GENETICS	12

Year 3

RMS3030	GENETIC ENGINEERING	12
RMS3020	GENOMICS, PROTEOMICS AND BIOINFORMATICS	12

Cell Biology/Microbiology

Year 2

RBF2300	MICROBIOLOGY 1	12
RBF2330	CELL BIOLOGY	12

Year Three

RMS3113	COMPARATIVE IMMUNOBIOLOGY	12
RMS3010	BIOPROCESSING APPLICATIONS	12

Analytical Chemistry

Year Two

RCS2601	ANALYTICAL CHEMISTRY 2A	12
RCS2602	ANALYTICAL CHEMISTRY 2B	12

Year Three

RCS3601	ANALYTICAL CHEMISTRY 3A	12
RCS3602	ANALYTICAL CHEMISTRY 3B	12

Forensic Chemistry

Year Two

RCS2100	ORGANIC CHEMISTRY 2A	12

OR

RCS2601	ANALYTICAL CHEMISTRY 2A	12
RCS2503	FORENSIC CHEMISTRY 2	12

Year Three

RCS3605	FORENSIC METHODS 3A	12
RCS2602	ANALYTICAL CHEMISTRY 2B	12

Community Science

Year Two

SED1101	COMMUNITY BASED GENERAL SCIENCE 1	12
SED1202	COMMUNITY BASED GENERAL SCIENCE 2	12

Year Three

SED2103	COMMUNITY BASED GENERAL SCIENCE 3	12

SED2204	COMMUNITY BASED GENERAL SCIENCE 4	12
Computing		
Year Two		
ECB2124	WEB-BASED SYSTEMS DEVELOPMENT	12
ECB1223	INTRODUCTION TO SYSTEMS ANALYSIS AND DATABASES	12
Year Three		
ECB2113	OPERATING SYSTEMS	12
ECB2253	IT PROJECT MANAGEMENT	12
Environmental Science		
Year Two		
RBF2640	AUSTRALIAN ANIMALS	12
RBF2620	AUSTRALIAN PLANTS	12
Year Three		
RBF3110	MARINE & FRESHWATER ECOLOGY	12
RBF3210	ENVIRONMENTAL REHABILITATION	12
Environmental Assessment and Analysis		
(For Ecology & Environmental Management Specialisation students only)		
Year Two		
RBF3610	BIOSTATISTICS	12
RBF3630	ENVIRONMENTAL IMPACTS AND MONITORING	12
Year Three		
RBM3101	GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR CONSERVATION & HEALTH	12
RBF3650	POLLUTION BIOLOGY	12
Mathematics/Statistics		
Year Two		
RCM1712	MATHEMATICAL FOUNDATIONS 2	12
RCM1614	APPLIED STATISTICS 2	12
Year Three		
RCM2712	MATHEMATICS OF CONTINUOUS PROCESSES A	12
RCM2611	LINEAR STATISTICAL MODELS	12

*Other sub-specialisations may be chosen from the College of Engineering and Science, College of Arts, or College of Business in consultation with the Course Coordinator.

BACHELOR OF SCIENCE (SPECIALISATION)

Course Code:SBSS
Campus: Werribee, Footscray Park, Year 1: Footscray Park campus. Year 2 & 3: Werribee campus.
This course is for Continuing students only.

About this course: The Bachelor of Science (Specialisation) course offers specialisations in the three science disciplines listed below:

- Biotechnology
- Chemistry
- Ecology & Environmental Management

Students can choose to specialise in one or two of these science disciplines. This is a three year course with a common first year and a choice of sub-specialisations in the latter two years that allows students the flexibility to add other studies of interest to their specialisation. Sub-specialisations can be chosen from health, engineering, science, arts, business and law. Sub-specialisations are subject to the approval of the course coordinator and may be limited by prerequisite requirements and timetable clashes. Science sub-specialisations are listed below.

- analytical chemistry
- cell biology/microbiology
- community science
- computing
- environmental science
- environmental assessment & analysis
- forensic chemistry
- mathematics
- molecular biology
- statistics.

The BSc (specialisation) is industry focused, offers an intensive hands-on laboratory experience, has modern laboratories with state-of-the-art equipment, provides opportunities for industry projects and placements and overall better prepares students for careers in the science profession. Those students with scientific research in mind can progress into Honours and postgraduate studies (subject to performance in the degree program).   Biotechnology Specialisation Biotechnology involves the use of biological cells and their components for the benefit of society. It includes the application of the latest technologies to solve medical, environmental and agricultural problems. The biotechnology specialisation prepares students for exciting careers in cutting edge science. It provides in-depth education in many areas of modern biology including genetic engineering, medical research, cloning, forensic biology, environmental biotechnology, microbiology and biochemistry. There is a strong emphasis on the development of laboratory-based skills for which the university is equipped with state-of-the-art facilities.   Chemistry Specialisation The chemistry specialisation has a strong industry focus and will produce graduates that are 'work ready' by combining an extensive laboratory program with training on state-of-the-art equipment along with an industry placement program. The course combines studies in analytical, forensic and organic chemistry to develop measurement and investigative skills that are highly sought after by industry. After completing second year, students have the opportunity to work in one of over twenty chemical industries as part of their studies. The laboratory program includes hands-on training in modern analytical techniques including atomic absorption spectroscopy, inductively coupled plasma optical emission spectroscopy, gas chromatography including gas chromatography-mass spectrometry, liquid chromatography including liquid chromatography-mass spectrometry, ion chromatography, ultraviolet and visible spectroscopy, fluorescence spectroscopy and Fourier transform infra-red spectroscopy. Over a million dollars of state-of-the-art analytical equipment has recently been acquired and extensive training on this equipment including applications, theory of operation, optimisation, maintenance and troubleshooting forms a major part of second and third year studies. The laboratory program is designed to give our chemistry graduates a genuine head start into the work force. Ecology & Environmental Management Specialisation Australia and the rest of the world face significant challenges in balancing the needs of a sustainable society while protecting the natural environment. The Ecology and Environmental Management specialisation develops skills in environmental sciences that underpin achievable sustainability strategies. Subjects combine extensive practical experience in the field (terrestrial, marine and freshwater environments) and laboratory, with theory that is based on current research and management practices. In partnership with industry, government agencies, researchers and the community, this specialisation produces graduates that are 'work-ready'. An emphasis on environmental research methodology across all subjects also leads to a high uptake into more highly specialised honours and postgraduate research projects. The Ecology and Environmental Management specialisation develops the knowledge and practical experience for working across social, environmental and economic contexts, to achieve ecological sustainability. Pathways to a Career in Teaching The BSc (Specialisation) offers a selection of units in mathematics and science, including six new innovative community science units, which prepare students wishing to pursue careers as maths/science teachers. The community science units are unique and emphasise learning in the workplace through placements in primary and secondary schools and in community education groups. To qualify for teaching in secondary schools graduates from the BSc (Specialisation) must apply for and complete the Graduate Diploma in Secondary Education.

Course Objectives: The Bachelor of Science (Specialisation)will produce graduates with a thorough knowledge of contemporary science for careers in industry, government and education. The selection of specialisations and sub-specialisations offered allows students the flexibility to customise their learning towards current and future career demands. Via various learning in the workplace and community strategies the course will make graduates 'work ready'. The course allows students wishing to pursue maths/science teaching via the Graduate Diploma in Secondary Education, a number of possibilities with respect to obtaining parts, sub-majors and majors in maths/science teaching specialist areas. Graduates from this course should be able to:

- locate, manage and use scientific information efficiently and effectively
- solve scientific problems effectively in a range of settings including industry and community
- exhibit high levels of numeracy skills in a range of scientific settings
- communicate effectively in spoken and written forms on a range of scientific and mathematical topics to professional and community groups
- apply an evidence-based research approach to a chosen area of science
- respond with social and cultural awareness within local and global environments
- work autonomously and collaboratively as a professional in both industry and community settings.

Careers: The Bachelor of Science (Specialisation) will produce graduates with a thorough knowledge of contemporary science for careers in industry, government and education. The flexibility of the course allows students to customise their learning towards current and future career demands. Biotechnology graduates pursue careers in a variety of areas including medical and pharmaceutical research, forensic science, agriculture and aquaculture, the food and beverage industry and education. Industries that employ our chemistry graduates include: agricultural chemicals, brewing and wine, chemical analysis, cosmetics, dairy, environmental science and water, food, forensics, horticulture, industrial chemicals, materials and polymers, petrochemicals, pharmaceutical, scientific sales, state and federal government departments. Careers in ecology and environmental management include: landcare/bushcare coordinator; environment officer or environmental planner; restoration ecology and land management officer; marine and freshwater ecosystem management officer; environmental educator; botanist/zoologist/ecologist and ecological and resource assessor. The course has been designed in collaboration with the College of Education and the science units offered provides pathways for students to pursue maths/science teaching. To qualify for teaching in secondary schools graduates from the BSc (Specialisation) must apply for and complete the Graduate Diploma in Secondary Education.

Course Duration:3 years

Admission Requirements International: To be considered to study this course, applicants must: ·have achieved an IELTS (Academic Module) result with an overall score of 6 (no band less than 6) or equivalent · have completed a secondary school qualification equivalent to Australia's year 12 or VCE qualification · completed studies in mathematics as part of their qualification

Admission Requirements Other: Provide an equivalent Police Check from your country prior to undertaking Community Science units of study. Applicants will also need to provide an equivalent working with Children Check prior to undertaking Community Science units of study.

COURSE STRUCTURE

To graduate with the SBSS Bachelor of Science (Specialisation) students must satisfy the following conditions:

- Successfully complete units of study totalling at least 288 credit points.
- A minimum of 240 credit points in approved units must be taken from the College of Engineering and Science.
- A maximum of 48 credit points in approved units can be taken from either the College of Arts or the College of Business.
- Successfully complete either of the following specialisation and sub-specialisation combinations.

Common Year 1 96 credit points + Specialisation 96 credit points + Specialisation 96 credit points or Common Year 1 96 credit points + Specialisation 96 credit points + Sub-specialisation 48 credit points + Sub-specialisation 48 credit points

- Units of study at the third year level totalling at least 48 credit points.
- Successfully complete in Year 3 the compulsory unit of study RSS3000 INDUSTRY PROJECT (12 credit points) taken in a chosen specialisation.

Semester One

RBF1150	GLOBAL ENVIRONMENTAL ISSUES	12
RBF1310	BIOLOGY 1	12
RCS1601	CHEMISTRY 1A	12
RCM1711	MATHEMATICAL FOUNDATIONS 1	12

Semester Two

RBF1320	BIOLOGY 2	12
RCM1114	INTRODUCTION TO COMPUTING AND THE INTERNET	12
RCS1602	CHEMISTRY 1B	12
RCM1613	APPLIED STATISTICS 1	12

List A: Specialisations

Biotechnology Specialisation

Year 2

Semester One

RBF2300	MICROBIOLOGY 1	12
RBF2520	BIOCHEMISTRY 1	12

Choose Year 2 sem 1 units of another Specialisation from List A

OR

Choose Year 2 sem 1 units of two Sub-specialisations from List B

Semester Two

RBF2330	CELL BIOLOGY	12
RBF2390	MOLECULAR GENETICS	12

Choose Year 2 sem 2 units of another Specialisation from List A

OR

Choose Year 2 sem 2 units of two Sub-specialisations from List B

Year 3

Choose RSS3000 Industry Project in one Specialisation in consultation with the Course Coordinator.

RSS3000	INDUSTRY PROJECT	12

Choose other units to the value of 36 credit points in semesters 1 and 2 from that Specialisation in consultation with the Course Coordinator.

Semester One

RMS3030	GENETIC ENGINEERING	12
RMS3113	COMPARATIVE IMMUNOBIOLOGY	12

Choose Year 3 sem 1 units of another Specialisation from List A

OR

Choose Year 3 sem 1 units of two Sub-specialisations from List B

Semester Two

RMS3010	BIOPROCESSING APPLICATIONS	12
RMS3020	GENOMICS, PROTEOMICS AND BIOINFORMATICS	12

Choose Year 3 sem 2 units of another Specialisation from List A

OR

Choose Year 3 sem 2 units of two Sub-specialisations from List B

Chemistry Specialisation

Year 2

Semester One

RCS2100	ORGANIC CHEMISTRY 2A	12
RCS2601	ANALYTICAL CHEMISTRY 2A	12

Choose Year 2 sem 1 units of another Specialisation from List A

OR

Choose Year 2 sem 1units of two Sub-specialisations from List B

Semester Two

RCS2503	FORENSIC CHEMISTRY 2	12
RCS2602	ANALYTICAL CHEMISTRY 2B	12

Choose Year 2 sem 2 units of another Specialisation from List A

OR

Choose Year 2 sem 2 units of two Sub-specialisations from List B

Year 3

Choose RSS3000 Industry Project in one Specialisation in consultation with the Course Coordinator.

RSS3000	INDUSTRY PROJECT	12

Choose other units to the value of 36 credit points in semesters 1 and 2 from that Specialisation in consultation with the Course Coordinator.

Semester One

RCS3601	ANALYTICAL CHEMISTRY 3A	12
RCS3605	FORENSIC METHODS 3A	12

Choose Year 3 sem 1 units of another Specialisation from List A

OR

Choose Year 3 sem 1 units of two Sub-specialisations from List B

Semester Two

RCS3602	ANALYTICAL CHEMISTRY 3B	12
RSS3000	INDUSTRY PROJECT	12

Choose Year 3 sem 2 units of another Specialisation from List A

OR

Choose Year 3 sem 2 units of two Sub-specialisations from List B

Ecology & Environmental Management Specialisation

Year 2

Semester One

RBF1160	AUSTRALIAN LANDSCAPES AND BIOTA	12
RBF2640	AUSTRALIAN ANIMALS	12

Choose Year 2 sem 1 units of another Specialisation from List A

OR

Choose Year 2 sem 1 units of two Sub-specialisations from List B

Semester Two

RBF2610	FUNDAMENTALS OF ECOLOGY	12
RBF2620	AUSTRALIAN PLANTS	12

Choose Year 2 sem 2 units of another Specialisation from List A

OR

Choose Year 2 sem 2 units of two Sub-specialisation from List B

Year 3

Choose RSS3000 Industry Project in one Specialisation in consultation with the Course Coordinator.

RSS3000	INDUSTRY PROJECT	12

Choose other units to the value of 36 credit points in semesters 1 and 2 from that Specialisation in consultation with the Course Coordinator.

Semester One

RBF3110	MARINE & FRESHWATER ECOLOGY	12
RBF3620	CONSERVATION AND SUSTAINABILITY	12

Choose Year 3 sem 1 units of another Specialisation from List A

OR

Choose Year 3 sem 1 units of two Sub-specialisations from List B

Semester Two

RBF3210	ENVIRONMENTAL REHABILITATION	12
RBM2201	CONSERVATION GENETICS	12

Choose Year 3 sem 2 units of another Specialisation from List A

OR

Choose Year 3 sem 2 units of two Sub-specialisations from List B

List B: *Sub-specialisations

Molecular Biology

Year 2

RBF2520	BIOCHEMISTRY 1	12
RBF2390	MOLECULAR GENETICS	12

Year 3

RMS3030	GENETIC ENGINEERING	12
RMS3020	GENOMICS, PROTEOMICS AND BIOINFORMATICS	12

Cell Biology/Microbiology

Year 2

RBF2300	MICROBIOLOGY 1	12
RBF2330	CELL BIOLOGY	12

Year Three

RMS3113	COMPARATIVE IMMUNOBIOLOGY	12
RMS3010	BIOPROCESSING APPLICATIONS	12

Analytical Chemistry

Year Two

RCS2601	ANALYTICAL CHEMISTRY 2A	12
RCS2602	ANALYTICAL CHEMISTRY 2B	12

Year Three

RCS3601	ANALYTICAL CHEMISTRY 3A	12
RCS3602	ANALYTICAL CHEMISTRY 3B	12

Forensic Chemistry

Year Two

RCS2100	ORGANIC CHEMISTRY 2A	12

OR

RCS2601	ANALYTICAL CHEMISTRY 2A	12
RCS2503	FORENSIC CHEMISTRY 2	12

Year Three

RCS3605	FORENSIC METHODS 3A	12
RCS2602	ANALYTICAL CHEMISTRY 2B	12

**Community Science

Year Two

SED1101	COMMUNITY BASED GENERAL SCIENCE 1	12
SED1202	COMMUNITY BASED GENERAL SCIENCE 2	12

Year Three

SED2103	COMMUNITY BASED GENERAL SCIENCE 3	12
SED2204	COMMUNITY BASED GENERAL SCIENCE 4	12

Computing

Year Two

ECB2124	WEB-BASED SYSTEMS DEVELOPMENT	12
ECB1223	INTRODUCTION TO SYSTEMS ANALYSIS AND DATABASES	12

Year Three

ECB2113	OPERATING SYSTEMS	12
ECB2253	IT PROJECT MANAGEMENT	12

Environmental Science

Year Two

RBF2640	AUSTRALIAN ANIMALS	12
RBF2620	AUSTRALIAN PLANTS	12

Year Three

RBF3110	MARINE & FRESHWATER ECOLOGY	12
RBF3210	ENVIRONMENTAL REHABILITATION	12

Environmental Assessment and Analysis

(For Ecology & Environmental Management Specialisation students only)

Year Two

RBF3610	BIOSTATISTICS	12
RBF3630	ENVIRONMENTAL IMPACTS AND MONITORING	12

Year Three

RBM3101	GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR CONSERVATION & HEALTH	12
RBF3650	POLLUTION BIOLOGY	12

Mathematics and Statistics

Choose four units in consultation with Course Coordinator

Year Two

RCM1712	MATHEMATICAL FOUNDATIONS 2	12
RCM1614	APPLIED STATISTICS 2	12

Year Three

RCM2712	MATHEMATICS OF CONTINUOUS PROCESSES A	12
RCM2611	LINEAR STATISTICAL MODELS	12

*Other sub-specialisations may be chosen from the College of Engineering and Science, College of Arts or College of Business in consultation with the Course Coordinator.

**Two further units of Community Science are available (see Course Coordinator).

GRADUATE DIPLOMA IN COMPUTER SCIENCE

Course Code:SGCS
Campus:VU Sydney, VU Sydney CRICOS #061902A.

About this course: The Graduate Diploma course is designed for graduates who want to acquire professional competence in Computer Science. This course develops graduates who have a sound conceptual foundation, including practical understanding of recent developments in computer technology and how these may be applied to solve a wide range of problems in business and industry.

Course Objectives: The Graduate Diploma course is designed for graduates who want to acquire professional competence in Computer Science. This course develops graduates who have a sound conceptual foundation, including practical understanding of recent developments in computer technology and how these may be applied to solve a wide range of problems in business and industry.

Careers: Completion of the course will prepare graduates for variety of computing careers such as software development, software engineering, web-based programming, networking administration.

Course Duration:1 year

Admission Requirements Year 12: Entry to the course is open to applicants with a first degree. Preference will be given to applicants whose degree contains major studies in a quantitative discipline. Other applicants whose occupation or experience indicates that they have the capacity to succeed may be accepted into the course.

COURSE STRUCTURE

The Graduate Diploma of Science in Computer Science (SGCS) is an eight (8) unit of study course (96 Credit Points) offered on a full-time basis over one year or on an equivalent part-time basis. The SGCS constitutes the first year of a two year nested Master of Science (Computer Science) course [SMCS]. Successful completion of the SGCS or an equivalent course allows a direct entry into the second year of SMCS course. Depending on demand, some of the following Computer Science streams may be offered:

- Software Development;
- Software Engineering;
- Network and Security;

Unit List

RCM5800	OBJECT ORIENTED PROGRAMMING GD1	12
RCM5802	INFORMATION SYSTEMS	12
RCM5803	DATA STRUCTURES AND PROGRAMMING	12
RCM5805	COMMUNICATION AND NETWORKS	12
RCM5810	SOFTWARE DEVELOPMENT	12
RCM5811	OPERATING SYSTEMS	12
RCM5813	ARTIFICIAL INTELLIGENCE	12
RCM5814	COMPUTER GRAPHICS	12
RCM5820	NETWORK OPERATING SYSTEMS ADMINISTRATION	12
RCM5824	OBJECT ORIENTED PROGRAMMING GD2	12
RCM6812	CRYPTOGRAPHY COMPUTER & NETWORK SECURITY	12
RCM6813	INTERNET SECURITY	12
RCM6822	INTERNET PROGRAMMING	12
RCM6841	SOFTWARE ENGINEERING 2	12
RCM6844	SOFTWARE ENGINEERING 1	12

BACHELOR OF SCIENCE (HONOURS) (APPLIED BIOLOGY)

Course Code:SHAB
Campus: St Albans.

Course Objectives: An Honours program is available in each of the degree specialisations. The aim of the honours program is to provide a course of advanced study at a fourth year level that builds on the knowledge and skills developed at degree level, and to prepare students for postgraduate research by developing skills in working independently, critical analysis of information, problem-solving, devising, designing and conducting experimental work and written and oral communication.

Course Duration:1 year

Admission Requirements Year 12: To qualify for entry to the honours program, applicants must hold a degree or equivalent with major studies in a relevant discipline and should normally have obtained a 'credit' average, or equivalent, in the final year of the degree.

COURSE STRUCTURE

The structure of the honours course is as follows:

Semester 1

RBF4001	SCIENCE HONOURS	48

Semester 1

RBF4002	SCIENCE HONOURS	48

(48 credit points per semester)

BACHELOR OF SCIENCE (HONOURS) BIOLOGY (BIOTECHNOLOGY)

Course Code:SHBB
Campus: Werribee.

About this course: The aim of the honours program is to provide a course of advanced study at a fourth year level which builds on the knowledge and skills developed at degree level, and to prepare students for postgraduate research by developing skills in working independently, critical analysis of information, problem-solving, devising, designing and conducting experimental work and written and oral communication.

Course Objectives: An Honours program is available in each of the degree specialisations. The aim of the honours program is to provide a course of advanced study at a fourth year level which builds on the knowledge and skills developed at degree level, and to prepare students for postgraduate research by developing skills in: working independently, critical analysis of information, problem-solving, devising, designing and conducting experimental work and written and oral communication.

Careers: Medical, biotechnology and pharmaceutical research or further studies to PhD.

Course Duration:1 year

Admission Requirements Year 12: To qualify for entry to the honours program, applicants must hold a degree or equivalent with major studies in a relevant discipline and should normally have obtained a 'credit' average, or equivalent, in the final year of the degree. Applicants must also have an approved project and supervisor prior to admission to the course.

COURSE STRUCTURE

The courses are offered on a full-time basis over one year or equivalent if on a part-time basis. Entry to the Honours program for the Conservation Biology and Environmental Management specialisation can be either at the beginning of the academic year (February) or at a mid-year intake (July) to allow for field-based research with seasonal limitations.

Semester 1

RBF4001	SCIENCE HONOURS	48

Semester 2

RBF4002	SCIENCE HONOURS	48

Other Course Specific Notes The course consists of advanced coursework and a research thesis. Assessment will be based on written assignments, seminar presentations, a written examination and the research thesis.

Coursework assessment will be based on seminar presentations, written assignments and examination.

BACHELOR OF SCIENCE (HONOURS) (CHEMICAL SCIENCES)

Course Code:SHCB
Campus: Werribee, Footscray Park.

Course Objectives:(for SHBT, SHFT and SHCB)An Honours program is available in each of the degree specialisations. The aim of the honours program is to provide a course of advanced study at a fourth year level which builds on the knowledge and skills developed at degree level, and to prepare students for postgraduate research by developing skills in: working independently, critical analysis of information, problem-solving, devising, designing and conducting experimental work and written and oral communication

Careers: Analytical or research chemist in fields including pharmaceuticals, food, polymers, forensics.

Course Duration:1 year

Admission Requirements Year 12: To qualify for entry to the honours program, applicants must hold a degree or equivalent with major studies in a relevant discipline and should normally have obtained a 'credit' average, or equivalent, in the final year of the degree. Applicants must also have an approved project and supervisor prior to admission to the course.

COURSE STRUCTURE

The courses are offered on a full-time basis over one year or equivalent if on a part-time basis. Entry to the Honours program for the Conservation Biology and Environmental Management specialisation can be either at the beginning of the academic year (February) or at a mid-year intake (July) to allow for field-based research with seasonal limitations.

Year 1

Semester 1

RCS4201	HONOURS COURSEWORK	24
RCS4601	HONOURS PROJECT PART TIME	24

Semester 2

RCS4602	HONOURS PROJECT	48
RCS4610	HONOURS PROJECT PART TIME	24

Part Time students enrol in RCS4610 over 2 semesters (24 credit points each semester)

The course consists of advanced coursework and a research thesis. Assessment will be based on written assignments, seminar presentations, a written examination and the research thesis.

Coursework assessment will be based on seminar presentations, written assignments and examination.

BACHELOR OF SCIENCE (HONOURS) (COMPUTER SCIENCE)

Course Code:SHCS
Campus: Footscray Park.

About this course: Students who do exceptionally well in their degree studies may be given the opportunity to gain an Honours degree by completing a fourth year of study in a specific field. This year is designed to assist students who may wish to proceed to higher degrees by research, but it also enables students to concentrate their studies more intensely on areas of particular interest. The Honours year requires students to select coursework units from one of the fields of Computer Science, Statistics, and Operations Research. As well, a minor thesis must be completed.

Course Objectives: Students who do exceptionally well in their degree studies may be given the opportunity to gain an Honours degree by completing a fourth year of study in a specific field. This year is designed to assist students who may wish to proceed to higher degrees by research, but it also enables students to concentrate their studies more intensely on areas of particular interest

Careers: Entry into a higher degree by research Programming, software development, software engineering Web design

Course Duration:1 year

Admission Requirements International:A three-year Bachelor degree in Computer Science, Information Technology, or equivalent, with a high average over the degree. An IELTS (Academic Module) result with an overall score of 6 (no band less than 6), or equivalent, must have been achieved.

Admission Requirements Other:A three-year Bachelor degree in Computer Science, Information Technology, or equivalent, with a high average over the degree.

COURSE STRUCTURE

This course is 1 year full-time or 2 years part-time.

Semester 1

RCM6106	THESIS (2 UNITS)	24
RCM6827	RESEARCH PERSPECTIVES IN COMPUTER SCIENCE	12
RCM6104	THESIS (1 UNIT)	12

Semester 2

RCM6107	THESIS (2 UNITS)	24
RCM6105	THESIS (1 UNIT)	12

1 approved Computer Science elective (1 x 12 credit points)

Elective approved at the discretion of the Honours Coordinator.

BACHELOR OF SCIENCE (HONOURS) (PHYSICS)

Course Code:SHPC
Campus: Footscray Park.

About this course: This course aims to broaden knowledge and understanding of physics and provide basic training to undertake research in physics. A research project is normally undertaken in one of the following areas: optical fibre sensors, laser physics, optoelectronic imaging, applied optics or vacuum technology.

Course Objectives: Research training will include the ability to devise, design and carry out research intended to yield data relevant to the solution of specific problems, the ability to develop and refine working hypotheses, to critically analyse data and to report results in an appropriate manner. The research project is normally undertaken in one of the following areas of expertise of the section: optical fibre sensors, laser physics, optoelectronic imaging, applied optics and vacuum technology.

Careers: Technical and scientific positions in a range of fields such as telecommunications.

Course Duration:1 year

Admission Requirements Year 12: To qualify for entry to the Honours program the applicant should have completed the requirements for a pass degree with major studies in an appropriate discipline. Entry is at the discretion of the Applied Physics section and applicants should normally have obtained a 'credit' average in the final year of the pass degree. For mature age applicants, an appropriate combination of qualifications and experience will be considered.

COURSE STRUCTURE

The course will be offered on a full-time basis over one year or part-time equivalent.

Semester 1

RPH4411	PHYSICS 4 (HONOURS)	48

Semester 2

RPH4412	PHYSICS 4 (HONOURS)	48

Academic Progression

A student will not be allowed to repeat the Honours year or any component of it without the permission of the Course Coordinator.

MASTER OF SCIENCE (COMPUTER SCIENCE)

Course Code:SMCS
Campus: Footscray Park, VU Sydney, VU Sydney CRICOS #064506M.

About this course: The Master of Science in Computer Science course develops a sound theoretical knowledge of contemporary Computer Science techniques. Emphasis is also placed on the application of these techniques in areas of business and industry.

Course Objectives: The Master of Science in Computer Science is a two year course at Victoria University that will provide graduates with the ability to:

- Provide a solid foundation in information technology skills and knowledge that can be applied across a wide range of applications;
- Provide an infrastructure through which students can gain technical, analytical, and managerial knowledge and interpersonal skills, and develop skills and abilities important for effective participation and leadership in industry.
- Emphasise a hands-on approach to learning and create real-world learning experiences.
- Critically analyse and perform research in ICT.
- Exercise ethical and professional practice, both individually and as a member of a team.
- Reflect on the students¿ own learning and strategies for continuing professional development.

The Master of Science in Computer Science course develops a sound theoretical knowledge and techniques of contemporary Computer Science. Emphasis is also placed on the application of these techniques in areas of business and industry.

Careers: Completion of the course will prepare graduates for variety of computing careers such as software development, software engineering, web-based programming, systems analyst, consultancy, networking and security, networking administration, database administration, system analysis in sectors including government, banking and finance, web-based publishing, retail, and manufacturing.

Course Duration:2 years

Admission Requirements International: Entry into the program is open to applicants with a first degree. Preference will be given to applicants whose degree contains major studies in a quantitative discipline. The minimum English requirement for admission to the Master of Computer Science is an IELTS of 6.5 (with no band less than 6.0) or equivalent. Equivalence is to be assessed by VU. Applicants with any of the following qualifications may apply for credits against specific coursework units. (a) A degree in computer science. (b) A four year Honours degree in computer science. (c) A pass degree (without a major in computer science) followed by an appropriate Graduate Diploma. (d) A combination of qualifications and experience equivalent to (a), (b), or (c) above.

Admission Requirements Mature Age: Entry into the program is open to applicants with a first degree. Preference will be given to applicants whose degree contains major studies in a quantitative discipline. Applicants with any of the following qualifications may apply for credits against specific coursework units. (a) A degree in computer science. (b) A four year Honours degree in computer science. (c) A pass degree (without a major in computer science) followed by an appropriate Graduate Diploma. (d) A combination of qualifications and experience equivalent to (a), (b), or (c) above.

COURSE STRUCTURE

The Master of Science (Computer Science) [SMCS] is 192 Credit Points postgraduate course offered on a full-time basis over two years or on an equivalent part-time basis. Since SMCS is a nested course, successful completion of six (6) core units and electives approved by the course coordinator provides exit points to Graduate Diploma in Computer Science (SGCS) or to Graduate Diploma in Software Engineering (SGSE).

CORE UNITS

RCM5800	OBJECT ORIENTED PROGRAMMING GD1	12
RCM5802	INFORMATION SYSTEMS	12
RCM5805	COMMUNICATION AND NETWORKS	12
RCM5811	OPERATING SYSTEMS	12
RCM5824	OBJECT ORIENTED PROGRAMMING GD2	12
RCM6844	SOFTWARE ENGINEERING 1	12

Students must complete at least two thesis units from the following list:

RCM6102	THESIS (2 UNITS)	24
RCM6103	THESIS (4 UNITS)	48
RCM6104	THESIS (1 UNIT)	12
RCM6105	THESIS (1 UNIT)	12
RCM6106	THESIS (2 UNITS)	24
RCM6107	THESIS (2 UNITS)	24

ELECTIVE UNITS

RCM5803	DATA STRUCTURES AND PROGRAMMING	12
RCM5810	SOFTWARE DEVELOPMENT	12
RCM5813	ARTIFICIAL INTELLIGENCE	12
RCM5814	COMPUTER GRAPHICS	12
RCM5820	NETWORK OPERATING SYSTEMS ADMINISTRATION	12
RCM6702	INTERNET DATA REPRESENTATION 1	12
RCM6710	INTERNET DATA MANAGEMENT 1	12
RCM6812	CRYPTOGRAPHY COMPUTER & NETWORK SECURITY	12
RCM6813	INTERNET SECURITY	12
RCM6819	USER INTERFACE DESIGN	12
RCM6820	DISTRIBUTED SYSTEMS	12
RCM6822	INTERNET PROGRAMMING	12
RCM6823	DATABASE DESIGN, MANAGEMENT AND ADMINISTRATION	12
RCM6827	RESEARCH PERSPECTIVES IN COMPUTER SCIENCE	12
RCM6841	SOFTWARE ENGINEERING 2	12
RCM6842	ADVANCED TOPICS IN SOFTWARE ENGINEERING	12
RCM6843	SOFTWARE ENGINEERING PROJECT	12
RCM6845	OBJECT ORIENTED TECHNOLOGY	12
RCM6846	OBJECT ORIENTED DESIGN	12

MASTER OF SCIENCE (RESEARCH)

Course Code:SRHC

Campus: Werribee, Footscray Park, St Albans, This course is also available off-campus..

About this course: Master of Science (Research) is designed to enhance the students' range of knowledge in various research fields across health, biomedicine, engineering and science and to enable a focusing of practical skills into a specific research area. It is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university processes.

Course Objectives: Graduates of this course have the academic knowledge, skills and attributes necessary to become capable, independent researchers, in order to be able to pursue a research-related or high level professional career in their industry and/or to pursue further research studies for a career as a Higher Education academic in their field of study. The course objectives are to produce graduates who have: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field. 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem. 3. expert cognitive, technical and creative skills to: o design, develop and implement a research project/s to systematically investigate a research problem. o develop, adapt and implement research methodologies to extend and redefine existing knowledge. o manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature. 4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8. autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Careers: PhD, research assistant, research technician

Course Duration:2 years

Admission Requirements Other:(a) Academic achievement and preparation to a level that is sufficient to undertake masters level research demonstrated in any one or more of the following: i. Qualified, at minimum, for a bachelors degree at a standard considered by the University to be sufficiently meritorious (normally Distinction average in the final year); or ii. Qualified for any other award judged by the University to be of a relevant and appropriate standard and have: ¿Produced evidence of professional experience; and ¿Fulfilled any other conditions relating to prerequisite studies which the University may impose. (b) Demonstrated competency in English sufficient to work at research masters level, through meeting one or more of the following criteria: i. Successful completion of one of the degrees stipulated under a) i) ¿ ii) above with English as the language of instruction and assessment and undertaken in a predominantly English speaking context; or ii. Been taught for two of the past five years at a tertiary institution where English was the primary language of instruction; or iii. Achieved an overall band score of not less than 6.5 in an International English Language Testing Service (IELTS) test with no individual band score below 6.0; or iv. Achieved a score of not less than 92 and no section score less than 22 in the internet-based Teaching of English Foreign Language (TOEFL) test; or v. Documented evidence of English proficiency equivalent to the above.

COURSE STRUCTURE

The course normally requires two years of full-time study or part-time equivalent.

College Health and Biomedicine

Biomedical Sciences Stream

Semester 1

RBM8001	RESEARCH THESIS 1 FULL TIME	48
RBM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBM8002	RESEARCH THESIS 2 FULL TIME	48
RBM8012	RESEARCH THESIS 2 PART TIME	24

Food Science Stream

Semester 1

RBF8001	RESEARCH THESIS 1 FULL TIME	48
RBF8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBF8002	RESEARCH THESIS 2 FULL TIME	48
RBF8012	RESEARCH THESIS 2 PART TIME	24

College of Engineering and Science

Biotechnology Stream

Semester 1

RBT8001	RESEARCH THESIS 1 FULL TIME	48
RBT8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBT8002	RESEARCH THESIS - SEM 2 (FULL-TIME)	48
RBT8012	RESEARCH THESIS - SEM 2 (PART-TIME)	24

Chemical Sciences Stream

Semester 1

RCS8001	RESEARCH THESIS 1 FULL TIME	48
RCS8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCS8002	RESEARCH THESIS 2 FULL TIME	48
RCS8012	RESEARCH THESIS 2 PART TIME	24

Computer Science and Mathematics Stream

Semester 1

RCM8001	RESEARCH THESIS 1 FULL TIME	48
RCM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCM8002	RESEARCH THESIS 2 FULL TIME	48
RCM8012	RESEARCH THESIS 2 PART TIME	24

MASTER OF SCIENCE (RESEARCH)

Course Code:SRLC
Campus: Footscray Park, St Albans, This course is also available off-campus..

About this course: Master of Science (Research) is designed to enhance the students' range of knowledge in various research fields across health, biomedicine, engineering and science and to enable a focusing of practical skills into a specific research area. It is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university processes.

Course Objectives: Graduates of this course have the academic knowledge, skills and attributes necessary to become capable, independent researchers, in order to be able to pursue a research-related or high level professional career in their industry and/or to pursue further research studies for a career as a Higher Education academic in their field of study. The course objectives are to produce graduates who have: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field. 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem. 3. expert cognitive, technical and creative skills to: o design, develop and implement a research project/s to systematically investigate a research problem. o develop, adapt and implement research methodologies to extend and redefine existing knowledge. o manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature. 4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8. autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Careers: PhD, research assistant, research technician

Course Duration:2 years

Admission Requirements Other:(a) Academic achievement and preparation to a level that is sufficient to undertake masters level research demonstrated in any one or more of the following: i. Qualified, at minimum, for a bachelors degree at a standard considered by the University to be sufficiently meritorious (normally Distinction average in the final year); or ii. Qualified for any other award judged by the University to be of a relevant and appropriate standard and have: ¿Produced evidence of professional experience; and ¿Fulfilled any other conditions relating to prerequisite studies which the University may impose. (b) Demonstrated competency in English sufficient to work at research masters level, through meeting one or more of the following criteria: i. Successful completion of one of the degrees stipulated under a) i) ¿ ii) above with English as the language of instruction and assessment and undertaken in a predominantly English speaking context; or ii. Been taught for two of the past five years at a tertiary institution where English was the primary language of instruction; or iii. Achieved an overall band score of not less than 6.5 in an International English Language Testing Service (IELTS) test with no individual band score below 6.0; or iv. Achieved a score of not less than 92 and no section score less than 22 in the internet-based Teaching of English Foreign Language (TOEFL) test; or v. Documented evidence of English proficiency equivalent to the above.

COURSE STRUCTURE

The course normally requires two years of full-time study or part-time equivalent.

College of Health and Biomedicine

Biomedical Sciences Stream

Semester 1

RBM8001	RESEARCH THESIS 1 FULL TIME	48
RBM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBM8002	RESEARCH THESIS 2 FULL TIME	48
RBM8012	RESEARCH THESIS 2 PART TIME	24

Food Science Stream

Semester 1

RBF8001	RESEARCH THESIS 1 FULL TIME	48
RBF8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBF8002	RESEARCH THESIS 2 FULL TIME	48
RBF8012	RESEARCH THESIS 2 PART TIME	24

College of Engineering and Science

Biotechnology Stream

Semester 1

RBT8001	RESEARCH THESIS 1 FULL TIME	48
RBT8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBT8002	RESEARCH THESIS - SEM 2 (FULL-TIME)	48
RBT8012	RESEARCH THESIS - SEM 2 (PART-TIME)	24

Chemical Sciences Stream

Semester 1

RCS8001	RESEARCH THESIS 1 FULL TIME	48
RCS8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCS8002	RESEARCH THESIS 2 FULL TIME	48
RCS8012	RESEARCH THESIS 2 PART TIME	24

Computer Science and Mathematics Stream

Semester 1

RCM8001	RESEARCH THESIS 1 FULL TIME	48
RCM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCM8002	RESEARCH THESIS 2 FULL TIME	48
RCM8012	RESEARCH THESIS 2 PART TIME	24

MASTER OF SCIENCE (RESEARCH)

Course Code:SRMS

Campus: Werribee, Footscray Park, St Albans.

About this course: Master of Science (Research) is designed to enhance the students' range of knowledge in various research fields across health, biomedicine, engineering and science and to enable a focusing of practical skills into a specific research area. It is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university processes.

Course Objectives: Graduates of this course have the academic knowledge, skills and attributes necessary to become capable, independent researchers, in order to be able to pursue a research-related or high level professional career in their industry and/or to pursue further research studies for a career as a Higher Education academic in their field of studies. The course objectives are to produce graduates who have: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field. 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem. 3. expert cognitive, technical and creative skills to: o design, develop and implement a research project/s to systematically investigate a research problem. o develop, adapt and implement research methodologies to extend and redefine existing knowledge. o manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature. 4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8. autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Careers: PhD, research assistant, research technician.

Course Duration: 2 years

Admission Requirements International: In addition to meeting the University requirements (See: Admission Requirements - Other) international applicants who will be studying in Melbourne must satisfy the English language qualifying requirement for gaining an entry visa to Australia for applicants from their country.

Admission Requirements Other: (a) Academic achievement and preparation to a level that is sufficient to undertake masters level research demonstrated in any one or more of the following: i. Qualified, at minimum, for a bachelors degree at a standard considered by the University to be sufficiently meritorious (normally Distinction average in the final year); or ii. Qualified for any other award judged by the University to be of a relevant and appropriate standard and have: ¿Produced evidence of professional experience; and ¿Fulfilled any other conditions relating to prerequisite studies which the University may impose. (b) Demonstrated competency in English sufficient to work at research masters level, through meeting one or more of the following criteria: i. Successful completion of one of the degrees stipulated under a) i) ¿ ii) above with English as the language of instruction and assessment and undertaken in a predominantly English speaking context; or ii. Been taught for two of the past five years at a tertiary institution where English was the primary language of instruction; or iii. Achieved an overall band score of not less than 6.5 in an International English Language Testing Service (IELTS) test with no individual band score below 6.0; or iv. Achieved a score of not less than 92 and no section score less than 22 in the internet-based Teaching of English Foreign Language (TOEFL) test; or v. Documented evidence of English proficiency equivalent to the above.

COURSE STRUCTURE

The course normally requires two years of full-time study or part-time equivalent.

College of Biomedical and Health Sciences

Biomedical Sciences Stream

Semester 1

RBM8001	RESEARCH THESIS 1 FULL TIME	48
RBM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBM8002	RESEARCH THESIS 2 FULL TIME	48
RBM8012	RESEARCH THESIS 2 PART TIME	24

Food Science Stream

Semester 1

RBF8001	RESEARCH THESIS 1 FULL TIME	48
RBF8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBF8002	RESEARCH THESIS 2 FULL TIME	48
RBF8012	RESEARCH THESIS 2 PART TIME	24

College of Engineering and Science

Biotechnology Stream

Semester 1

RBT8001	RESEARCH THESIS 1 FULL TIME	48
RBT8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RBT8002	RESEARCH THESIS - SEM 2 (FULL-TIME)	48
RBT8012	RESEARCH THESIS - SEM 2 (PART-TIME)	24

Chemical Sciences Stream

Semester 1

RCS8001	RESEARCH THESIS 1 FULL TIME	48
RCS8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCS8002	RESEARCH THESIS 2 FULL TIME	48
RCS8012	RESEARCH THESIS 2 PART TIME	24

Computer Science and Mathematics Stream

Semester 1

RCM8001	RESEARCH THESIS 1 FULL TIME	48
RCM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCM8002	RESEARCH THESIS 2 FULL TIME	48
RCM8012	RESEARCH THESIS 2 PART TIME	24

MASTER OF SCIENCE

Course Code:SRNL
Campus: Footscray Park.

About this course: The Master of Science is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university processes. Students may include some coursework studies during their candidature as recommended by the university. Academic staff, with suitable qualifications and proven research skills, supervise students in research fields of Computer Science or Mathematics.

Course Objectives: The Master of Science is normally undertaken purely by research on a topic that is agreed between the student and supervisor and is endorsed through university processes. Students may include some coursework studies during their candidature as recommended by the university. Academic staff, with suitable qualifications and proven research skills, supervise students in research fields of Computer Science or Mathematics.

Careers: Academic and research focused positions in the relevant fields of study.

Course Duration:2 years

Admission Requirements Other: Completed a Master degree by research or coursework or a relevant four year Honours degree or its equivalent at a high standard in Computer Science, Information Technology or Mathematics.

COURSE STRUCTURE

This course is of 2 year duration on a full time basis or part time equivalent.

Semester 1

RCM8001	RESEARCH THESIS 1 FULL TIME	48
RCM8011	RESEARCH THESIS 1 PART TIME	24

Semester 2

RCM8002	RESEARCH THESIS 2 FULL TIME	48
RCM8012	RESEARCH THESIS 2 PART TIME	24

DIPLOMA OF INFORMATION TECHNOLOGY

Course Code:TDIT
Campus: Werribee, Footscray Nicholson, City Queen, City Flinders, Off-shore, St Albans.

About this course: This course helps you develop the skills and knowledge in a range of Information Technology fields allowing you to progress your qualifications and career in IT. Successful completion of the Diploma provides guaranteed entry into the second year of the Bachelor of Information Technology (Network and Systems Computing). In this course you will: design databases write computer programs in JAVA schedule ICT development using Microsoft Project connect MySQL databases to PHP websites use Linux and study towards popular IT vendor certifications

Course Objectives: Students will develop a broad overview of ICT practice and the skills required to equip them to work in paraprofessional settings. Preparatory skills will be developed in general ICT practice, Programming, Networking, Web Design and Web database connectivity, databases and systems Analysis, IT service management with elective studies in operating systems, eCommerce, mobile technologies and data reporting. The course will enable students to prepare successfully and obtain entry into the second year of a relevant Bachelor degree. Key features of the study experience will be developing and embedding the academic and business writing skills required to meet these outcomes. The study will be aligned to major ICT industry certifications including, CISCO, Microsoft, RedHat and ITIL/Prince2.

Careers: Graduates of this course find entry-level work in:

- computer and network support
- website development
- database management
- programming

Course Duration:1 year

Admission Requirements Year 12: Units 3 and 4 - a study score of at least 25 in English (ESL) or 20 in any other English.

Admission Requirements International: English: IELTS - an overall band score of minimum 5.5 (no band less than 5.0) or equivalent. Academic: equivalent to an Australian year 12.

Admission Requirements Mature Age: Successful Completion of the Certificate IV in Information Technology or Relevant industry experiences. Students can apply via VTAC or direct application to the University.

Admission Requirements VET: Certificate IV in Information Technology.

COURSE STRUCTURE

The Course is offered over 1 year (2 semesters) on full time basis and equivalent part time. To qualify for the award of Diploma of Information Technology, a total of 96 credit points should be completed.

Year 1, Semester 1

ITD1009	INTRODUCTION TO OBJECT ORIENTED PROGRAMMING CONCEPTS	12
ITD1004	WEB TECHNOLOGIES	12
ITD1006	DATABASES AND INFORMATION PROCESSING	12
ITD1008	OPERATING SYSTEMS	12
ITD1002	PROGRAMMING A	6
ITD1022	PROGRAMMING B	6

Year 1, Semester 2

ITD1010	COMMUNICATION FOR THE COMPUTER PROFESSIONAL	12
ITD1005	WEB DATABASE TECHNOLOGIES	12
ITD1007	MANAGING IT	12
ITD1003	NETWORKING	12

ADVANCED DIPLOMA OF COMPUTER SYSTEMS ENGINEERING

Course Code:UEE60410

Campus: Footscray Nicholson, Industry, City Flinders, St Albans.

About this course: Expand your career options in computer networking and engineering. You will train in managing computer systems, computer networks, Internet and intranet infrastructure, design, programming and maintenance. You will study towards a number of highly valued vendor certifications offered by our partners: CISCO (CCNA Exploration), Microsoft MCITP (Server 2008 Administrator), ComTIA A+ and Linux (Redhat). Further studies will give you the opportunity to complete a Diploma of Information Technology (General); and/or Advanced Diploma of Information Technology (Network Security).

Course Objectives: People gaining this qualification are able to design, validate/evaluate and administer computer networks and systems, manage risk, estimate and manage projects and provide technical advice/sales.

Careers: Graduates of this course could be employed in the following areas: MCSE & CCNA Systems/Network Administrator, ICT Network Specialist, ICT Security Specialist, IT Security Administrator, IT Security Analyst/Engineer, Network and Systems Manager, Network Engineer, Security Administrator, Web Administrator.

Course Duration:2 years

Admission Requirements Year 12: Successful completion of VCE or equivalent

Admission Requirements International:IETLS 5.5

Admission Requirements Mature Age: Applicants must have successfully completed UEE20507, ICA30105 or equivalent

Selection Processes: Direct Entry, Written Application, VTAC

COURSE STRUCTURE

Students must successfully complete 10 core units plus a minimum of 2 stream cores, and achieve a Unit Strand Total at least 80 of which up to 6 shall be selected from Schedule 2, up to 46 from Schedule 3-4 and at least at least 28 at Schedule 5 or above.

Year One

Programming with Java

UEENEED003B	EVALUATE AND MODIFY PROGRAMS WRITTEN IN OBJECT ORIENTED CODE	40
UEENEED011B	DEVELOP OBJECT ORIENTED CODE	140

Networking

UEENEED017B	INSTALL AND CONFIGURE INTERNETWORKING SYSTEMS	120

Database Design and Queries

ICAB4136A	USE STRUCTURED QUERY LANGUAGE TO CREATE DATABASE STRUCTURES AND MANIPULATE DATA	60

HTML and Javascript

UEENEED029B	DEVELOP BASIC WEB PAGES FOR ENGINEERING APPLICATIONS	40

Service Management

BSBFLM506B	MANAGE WORKPLACE INFORMATION SYSTEMS	60

Web Administration

UEENEED010B	SET UP AND CREATE CONTENT FOR A WEB SERVER	120

Project Management - MS Project

UEENEEE015B	DEVELOP DESIGN BRIEFS FOR ELECTROTECHNOLOGY PROJECTS	40
UEENEEH041B	MANAGE ELECTRONICS/COMPUTER SYSTEMS PROJECTS	40
UEENEED048B	PLAN COMPUTER SYSTEMS PROJECT	60

Set up and deploy a Windows 7 workstation

UEENEED012B	SUPPORT COMPUTER HARDWARE AND SOFTWARE	120
UEENEED043B	INSTALL AND CONFIGURE OPERATING SYSTEMS AND SOFTWARE	40
UEENEED046B	SET UP AND CONFIGURE BASIC LOCAL AREA NETWORK	40

Computer Hardware for A+

UEENEEE001B	APPLY OHS PRACTICES IN THE WORKPLACE	20

UEENEEE032B	DOCUMENT OCCUPATIONAL HAZARDS AND RISKS IN COMPUTER SYSTEMS	20
UEENEED002B	ASSEMBLE, SET UP AND TEST PERSONAL COMPUTERS	80
UEENEEE002B	DISMANTLE, ASSEMBLE AND FABRICATE ELECTROTECHNOLOGY COMPONENTS	40

Year Two

Windows 2003 Server Administration

UEENEED014B	DESIGN AND MANAGE ENTERPRISE NETWORKS	80
UEENEED015B	ADMINISTER USER NETWORKS	80

Linux Administration and Internet Infrastructure

UEENEED013B	INSTALL AND ADMINISTER UNIX BASED COMPUTERS	80
UEENEED024B	INTEGRATE MULTIPLE COMPUTER OPERATING SYSTEMS ON A CLIENT SERVER NETWORK	80

Advanced Windows 2003 Administration

UEENEED016B	DEVELOP NETWORK SERVICES	120

CCNA Internetworking 3 & 4

UEENEED018B	DESIGN AND IMPLEMENT INTERNETWORKING SYSTEMS	120

Wireless networking for Enterprises

UEENEED023B	DESIGN AND IMPLEMENT INTERNETWORKING SYSTEMS ¿ WIRELESS LANS/WANS	100

Firewall and Enterprise security

UEENEED002B	ASSEMBLE, SET UP AND TEST PERSONAL COMPUTERS	80

ICT Professional Practice

UEENEED044B	COMMISSION COMPUTER SYSTEMS	20
BSBFLM512B	ENSURE TEAM EFFECTIVENESS	60
UEENEED045B	MODIFY-REDESIGN OF COMPUTER SYSTEM	20
UEENEEE078B	CONTRIBUTE TO RISK MANAGEMENT IN ELECTROTECHNOLOGY SYSTEMS	20
UEENEEH088B	DESIGN AND DEVELOP ELECTRONICS/COMPUTER PROJECTS	40
UEENEEE070B	WRITE SPECIFICATIONS FOR COMPUTER SYSTEMS ENGINEERING PROJECTS	40
UEENEEE017B	IMPLEMENT AND MONITOR OHS POLICIES AND PROCEDURES	20
UEENEEE038B	PARTICIPATE IN DEVELOPMENT AND FOLLOW A PERSONAL COMPETENCY DEVELOPMENT PLAN	20

ADVANCED DIPLOMA OF ENGINEERING TECHNOLOGY - ELECTRICAL

Course Code:UEE62111
Campus: Industry, Sunshine.

About this course: Expand your career options by learning the skills to design, validate, evaluate electrical equipment and systems and provide technical or sales advice. This course provides skill sets that prepare students for specific industry areas such as:

- Motor control
- PLC programming
- Electronic design
- Sustainable practices
- SCADA
- Low voltage installations.

Course Objectives: This qualification will provide competencies to design, validate, evaluate electrical equipment systems, provide technical advice and sales.

- Electronics Technician
- Electrical Technician
- Electrical Engineer
- Technical Officer (Electrical).

Careers:

Course Duration:2 years

Admission Requirements Year 12: Successful completion of VCE or equivalent

Admission Requirements International:IELTS 5.5 or equivalent

Admission Requirements Mature Age: Minimum age of 18 and one year out of school

Admission Requirements VET: Successful completion of VCE or equivalent

Selection Processes: Direct Entry, VTAC

COURSE STRUCTURE

All the Core competency standard units, defined in the Core Competency Standard Units A combination of Elective competency standard units to achieve a total weighting of 720 points in accordance with the Elective Competency Standard Units. Group Minimum Points Maximum Points A Imported and Common Elective Units Imported units from other training packages and/or state accredited courses can be added to this group, but they must be selected from qualifications where the unit is first packaged at AQF level 6. If units have not being assigned a weighting by the relevant EE-Oz Industry Technical Advisory Committee, their weighting will be 10 points. 0 360 B Qualification Elective Units 0 160 C Qualification Elective Units 0 220 D Qualification Elective Units 0 220 E Qualification Elective Units You may select all your elective units from this Group 200 720

Core Units of Study

UEENEED104A	USE SOFTWARE FOR ENGINEERING APPLICATIONS	40
UEENEEE011C	MANAGE RISK IN ELECTROTECHNOLOGY ACTIVITIES	60
UEENEEE015B	DEVELOP DESIGN BRIEFS FOR ELECTROTECHNOLOGY PROJECTS	40
UEENEEE071B	WRITE SPECIFICATIONS FOR ELECTRICAL ENGINEERING PROJECTS	40
UEENEEE080A	APPLY INDUSTRY AND COMMUNITY STANDARDS TO ENGINEERING ACTIVITIES	20
UEENEEE081A	APPLY MATERIAL SCIENCE TO SOLVING ELECTROTECHNOLOGY ENGINEERING PROBLEMS	60
UEENEEE082A	APPLY PHYSICS TO SOLVING ELECTROTECHNOLOGY ENGINEERING PROBLEMS	60
UEENEEE083A	ESTABLISH AND FOLLOW A COMPETENCY DEVELOPMENT PLAN IN AN ELECTROTECHNOLOGY ENGINEERING DISCIPLINE	20
UEENEEE101A	APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE	20
UEENEEE102A	FABRICATE, DISMANTLE, ASSEMBLE OF UTILITIES INDUSTRY COMPONENTS	40
UEENEEE104A	SOLVE PROBLEMS IN D.C. CIRCUITS	80
UEENEEE107A	USE DRAWINGS, DIAGRAMS, SCHEDULES, STANDARDS, CODES AND SPECIFICATIONS	40
UEENEEE117A	IMPLEMENT AND MONITOR ENERGY SECTOR OHS POLICIES AND PROCEDURES	20
UEENEEE124A	COMPILE AND PRODUCE AN ENERGY SECTOR DETAILED REPORT	60
UEENEEE125A	PROVIDE SOLUTIONS TO COMPLEX MULTIPLE PATH CIRCUITS PROBLEMS	60
UEENEEE126A	PROVIDE SOLUTIONS TO BASIC ENGINEERING COMPUTATIONAL PROBLEMS	60
UEENEEE137A	DOCUMENT AND APPLY MEASURES TO CONTROL OHS RISKS ASSOCIATED WITH ELECTROTECHNOLOGY WORK	20
UEENEEG006A	SOLVE PROBLEMS IN SINGLE AND THREE PHASE LOW VOLTAGE MACHINES	80
UEENEEG033A	SOLVE PROBLEMS IN SINGLE AND THREE PHASE LOW VOLTAGE ELECTRICAL APPARATUS AND CIRCUITS	60
UEENEEG063A	ARRANGE CIRCUITS, CONTROL AND PROTECTION FOR GENERAL ELECTRICAL INSTALLATIONS	40
UEENEEG101A	SOLVE PROBLEMS IN ELECTROMAGNETIC DEVICES AND RELATED CIRCUITS	60
UEENEEG102A	SOLVE PROBLEMS IN LOW VOLTAGE A.C. CIRCUITS	80
UEENEEG106A	TERMINATE CABLES, CORDS AND ACCESSORIES FOR LOW VOLTAGE CIRCUITS	40
UEENEEG107A	SELECT WIRING SYSTEMS AND CABLES FOR LOW VOLTAGE GENERAL ELECTRICAL INSTALLATIONS	80
UEENEEG149A	PROVIDE ENGINEERING SOLUTIONS TO PROBLEMS IN COMPLEX POLYPHASE POWER CIRCUITS	60
UEENEEG169A	MANAGE LARGE ELECTRICAL PROJECTS	40
UEENEEG170A	PLAN LARGE ELECTRICAL PROJECTS	60
UEENEEK132A	DEVELOP ENERGY SECTOR STRATEGIES TO ADDRESS ENVIRONMENTAL AND SUSTAINABILITY ISSUES	20

Elective Units of Study - Group A

UEENEEC001B	MAINTAIN DOCUMENTATION	20
UEENEEC002B	SOURCE AND PURCHASE MATERIAL/PARTS FOR INSTALLATION OR SERVICE JOBS	20
UEENEEC003B	PROVIDE QUOTATIONS FOR INSTALLATION OR SERVICE JOBS	20
UEENEEC010B	DELIVER A SERVICE TO CUSTOMERS	20
UEENEED101A	USE COMPUTER APPLICATIONS RELEVANT TO A WORKPLACE	20
UEENEEE020B	PROVIDE BASIC INSTRUCTION IN THE USE OF ELECTROTECHNOLOGY APPARATUS	20
UEENEEE146A	IDENTIFY EFFECTS OF ENERGY ON MACHINERY AND MATERIALS IN AN ENERGY SECTOR ENVIRONMENT	120
UEENEEE150A	UNDERTAKE COMPUTATIONS IN AN ENERGY SECTOR ENVIRONMENT	120

Elective Units of Study - Group B

UEENEEE105A	FIX AND SECURE ELECTROTECHNOLOGY EQUIPMENT	20
UEENEEE121A	PLAN AN INTEGRATED CABLING INSTALLATION SYSTEM	40
UEENEEE190A	PREPARE ENGINEERING DRAWINGS USING MANUAL DRAFTING AND CAD FOR ELECTROTECHNOLOGY/UTILITIES APPLICATIONS	60
UEENEEE191A	PREPARE ELECTROTECHNOLOGY/UTILITIES DRAWINGS USING MANUAL DRAFTING AND CAD EQUIPMENT AND SOFTWARE	60
UEENEEF102A	INSTALL AND MAINTAIN CABLING FOR MULTIPLE ACCESS	120

	TO TELECOMMUNICATION SERVICES	
UEENEEF104A	INSTALL AND MODIFY PERFORMANCE DATA COMMUNICATION COPPER CABLING	40
UEENEEG111A	CARRY OUT BASIC REPAIRS TO ELECTRICAL COMPONENTS AND EQUIPMENT	40
UEENEEG120A	SELECT AND ARRANGE EQUIPMENT FOR SPECIAL LV ELECTRICAL INSTALLATIONS	60
UEENEEG182A	SUPPLY EFFECTIVE AND EFFICIENT LIGHTING PRODUCTS FOR DOMESTIC AND SMALL COMMERCIAL APPLICATIONS	20
UEENEEG183A	PROVIDE ADVICE ON THE APPLICATION OF ENERGY EFFICIENT LIGHTING FOR AMBIENT AND AESTHETIC EFFECT	20
UEENEEH102A	REPAIRS BASIC ELECTRONIC APPARATUS FAULTS BY REPLACEMENT OF COMPONENTS	40
UEENEEH111A	TROUBLESHOOT SINGLE PHASE INPUT D.C. POWER SUPPLIES	40
UEENEEH150A	ASSEMBLE AND SET UP BASIC SECURITY SYSTEMS	80
UEENEEI101A	USE INSTRUMENTATION DRAWINGS, SPECIFICATION, STANDARDS AND EQUIPMENT MANUALS	40
UEENEEI116A	ASSEMBLE, ENTER AND VERIFY OPERATING INSTRUCTIONS IN MICROPROCESSOR EQUIPPED DEVICES	20
UEENEEI138A	PROVIDE SOLUTIONS TO EXTRA LOW VOLTAGE (ELV) ELECTRO-PNEUMATIC CONTROL SYSTEMS AND DRIVES	60
UEENEEI140A	PLAN THE ELECTRICAL INSTALLATION OF INTEGRATED SYSTEMS	20
UEENEEI141A	DEVELOP ELECTRICAL INTEGRATED SYSTEMS	20
UEENEEI150A	DEVELOP, ENTER AND VERIFY DISCRETE CONTROL PROGRAMS FOR PROGRAMMABLE CONTROLLERS	60
UEENEEK125A	SOLVE BASIC PROBLEMS IN PHOTOVOLTAIC ENERGY APPARATUS AND SYSTEMS	40

Elective Units of Study - Group C

UEENEEC005B	ESTIMATE ELECTROTECHNOLOGY PROJECTS	40
UEENEEG125A	PLAN ELECTRICAL INSTALLATIONS WITH A LOW VOLTAGE DEMAND UP TO 400 A PER PHASE	40
UEENEEG128A	PLAN LOW VOLTAGE SWITCHBOARD AND CONTROL PANEL LAYOUTS	40
UEENEEG179A	DEVELOP DETAILED ELECTRICAL DRAWINGS	60
UEENEEG184A	PROVIDE PHOTOMETRIC DATA FOR ILLUMINATION SYSTEM DESIGN	80
UEENEEG185A	SELECT EFFECTIVE AND EFFICIENT LIGHT SOURCES AND LUMINARIES FOR GIVEN LOCATIONS AND DESIGNS	60
UEENEEG186A	DESIGN EFFECTIVE AND EFFICIENT LIGHTING FOR RESIDENTIAL AND COMMERCIAL BUILDINGS	60
UEENEEG188A	PREPARE QUOTATIONS FOR THE SUPPLY OF EFFECTIVE AND EFFICIENT LIGHTING PRODUCTS FOR LIGHTING PROJECTS	40
UEENEEI142A	DEVELOP AN ELECTRICAL INTEGRATED SYSTEM INTERFACE FOR ACCESS THROUGH A TOUCH SCREEN	20
UEENEEI143A	DEVELOP ACCESS CONTROL OF ELECTRICAL INTEGRATED SYSTEMS USING LOGIC-BASED PROGRAMMING TOOLS	20
UEENEEI144A	DEVELOP INTERFACES FOR MULTIPLE ACCESS METHODS TO MONITOR, SCHEDULE AND CONTROL AN ELECTRICAL INTEGRATED SYSTEM	20
UEENEEI151A	DEVELOP, ENTER AND VERIFY WORD AND ANALOGUE CONTROL PROGRAMS FOR PROGRAMMABLE LOGIC CONTROLLERS	60
UEENEEI152A	DEVELOP, ENTER AND VERIFY PROGRAMS IN SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEMS	60
UEENEEI155A	DEVELOP STRUCTURED PROGRAMS TO CONTROL EXTERNAL DEVICES	40
UEENEEK135A	DESIGN GRID CONNECTED PHOTOVOLTAIC POWER SUPPLY SYSTEMS	60

Elective Units of Study - Group D

UEENEEC006B	PREPARE TENDER SUBMISSIONS FOR ELECTROTECHNOLOGY PROJECTS	60
UEENEED147A	DEVELOP ENERGY SECTOR DIRECTORY SERVICES	80
UEENEEE127A	USE ADVANCED COMPUTATIONAL PROCESSES TO PROVIDE SOLUTIONS TO ENERGY SECTOR ENGINEERING PROBLEMS	120
UEENEEG127A	DESIGN ELECTRICAL INSTALLATIONS WITH A LOW VOLTAGE DEMAND GREATER THAN 400 A PER PHASE	40
UEENEEG131A	EVALUATE PERFORMANCE OF LOW VOLTAGE ELECTRICAL APPARATUS	40
UEENEEG180A	DEVELOP DETAILED AND COMPLEX DRAWINGS FOR ELECTRICAL SYSTEMS USING CAD SYSTEMS	80
UEENEEG187A	DESIGN EFFECTIVE AND EFFICIENT LIGHTING FOR PUBLIC, OPEN AND SPORTS AREAS	60

UEENEEI145A	DIAGNOSE AND RECTIFY FAULTS IN A.C. MOTOR DRIVE SYSTEMS	60
UEENEEI146A	DIAGNOSE AND RECTIFY FAULTS IN D.C. MOTOR DRIVE SYSTEMS	60
UEENEEI147A	DIAGNOSE AND RECTIFY FAULTS IN SERVO DRIVE SYSTEMS	60
UEENEEI156A	DEVELOP AND TEST CODE FOR MICROCONTROLLER DEVICES	60
UEENEEI157A	CONFIGURE AND MAINTAIN INDUSTRIAL CONTROL SYSTEM NETWORKS	60
UEENEEE128A	DEVELOP ENGINEERING SOLUTIONS TO PHOTONIC SYSTEM PROBLEMS	80

Elective Units of Study - Group E

UEENEED149A	DEVELOP ENERGY SECTOR COMPUTER NETWORK APPLICATIONS INFRASTRUCTURE	80
UEENEEE078B	CONTRIBUTE TO RISK MANAGEMENT IN ELECTROTECHNOLOGY SYSTEMS	20
UEENEEE160A	PROVIDE ENGINEERING SOLUTIONS FOR USES OF MATERIALS AND THERMODYNAMIC EFFECTS	100
UEENEEE161A	ANALYSE STATIC AND DYNAMIC PARAMETERS OF ELECTRICAL EQUIPMENT	80
UEENEEE162A	SELECT DRIVE COMPONENTS FOR ELECTRICAL EQUIPMENT DESIGN	80
UEENEEE163A	ANALYSE MATERIALS FOR SUITABILITY IN ELECTRICAL EQUIPMENT	80
UEENEEE164A	DESIGN ELECTRICAL MACHINE DRIVES AND PRODUCTION LAYOUT PLANS	80
UEENEEG130A	DESIGN SWITCHBOARDS RATED FOR HIGH FAULT LEVELS (GREATER THAN 400 A)	60
UEENEEG143A	DEVELOP ENGINEERING SOLUTION FOR SYNCHRONOUS MACHINE AND CONTROL PROBLEMS	60
UEENEEG144A	DEVELOP ENGINEERING SOLUTIONS FOR D.C. MACHINE AND CONTROL PROBLEMS	60
UEENEEG145A	DEVELOP ENGINEERING SOLUTIONS FOR INDUCTION MACHINE AND CONTROL PROBLEMS	60
UEENEEG160A	EVALUATE PERFORMANCE OF LV ELECTRICAL MACHINES	40
UEENEEG161A	DESIGN AND DEVELOP MODIFICATIONS TO LV ELECTRICAL MACHINES	60
UEENEEH147A	ASSESS ELECTRONIC APPARATUS COMPLIANCE	60
UEENEEH188A	DESIGN AND DEVELOP ELECTRONICS - COMPUTER SYSTEMS PROJECTS	40
UEENEEI123A	DESIGN ELECTRONIC CONTROL SYSTEMS	60
UEENEEI129A	SET UP ELECTRONICALLY CONTROLLED MECHANICALLY OPERATED COMPLEX SYSTEMS	80
UEENEEI130A	SET UP ELECTRONICALLY CONTROLLED ROBOTICALLY OPERATED COMPLEX SYSTEMS	80
UEENEEI153A	DESIGN AND CONFIGURE HUMAN-MACHINE INTERFACE (HMI) NETWORKS	60
UEENEEI154A	DESIGN AND USE ADVANCED PROGRAMMING TOOLS PC NETWORKS AND HMI INTERFACING	120
UEENEEK133A	DESIGN HYBRID RENEWABLE POWER SYSTEMS	80
UEENEEK139A	DESIGN STAND-ALONE RENEWABLE ENERGY (RE) SYSTEMS	40
UEENEEK140A	DEVELOP ENGINEERING SOLUTIONS TO RENEWABLE ENERGY (RE) PROBLEMS	60
UEENEEK146A	DESIGN ENERGY MANAGEMENT CONTROLS FOR ELECTRICAL INSTALLATIONS IN BUILDINGS	80
UEENEEK151A	DEVELOP EFFECTIVE ENGINEERING STRATEGIES FOR ENERGY REDUCTION IN BUILDINGS	120
UEENEEM052A	CLASSIFY HAZARDOUS AREAS - GAS ATMOSPHERES	40
UEENEEM053A	CLASSIFY HAZARDOUS AREAS - DUST ATMOSPHERES	40
UEENEEM057A	DESIGN EXPLOSION-PROTECTED ELECTRICAL SYSTEMS AND INSTALLATIONS - GAS ATMOSPHERES	20
UEENEEM058A	DESIGN EXPLOSION-PROTECTED ELECTRICAL SYSTEMS AND INSTALLATIONS - DUST ATMOSPHERES	20
UEENEEM059A	DESIGN EXPLOSION-PROTECTED ELECTRICAL SYSTEMS AND INSTALLATIONS - PRESSURISATION	20
UEENEEM068A	ASSESS THE FITNESS-FOR-PURPOSE OF HAZARDOUS AREAS EXPLOSION-PROTECTED EQUIPMENT - GAS ATMOSPHERES	60
UEENEEM079A	DESIGN OF GAS DETECTION SYSTEMS	20
UEENEEM075A	DESIGN EXPLOSION-PROTECTED ELECTRICAL SYSTEMS - COAL MINING	20

UNITS

ACMACR402A ASSESS AND IMPOUND ANIMALS

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of seizing, handling and transporting animals in routine situations according to relevant legislation and organisational policies and procedures in an animal control and regulation environment. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMACR403A IDENTIFY AND RESPOND TO ANIMAL BEHAVIOUR

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of identifying animals and interpreting their body language and behaviour in the context of an animal control and regulation environment during day-to-day activities. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMACR404A MANAGE CONFLICT SITUATIONS WITHIN ANIMAL CONTROL AND REGULATIONS ENVIRONMENT

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of handling and resolving disputes and/or conflict situations that may arise in activities undertaken by personnel operating in an animal control and regulation environment. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMACR406A CARRY OUT POUND PROCEDURES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of providing appropriate management of impounded and surrendered animals including receiving animals, maintaining pound hygiene, providing the appropriate level of care for animals and discharging animals accordingly. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMATE301A WORK WITHIN AN ANIMAL TECHNOLOGY FACILITY

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of working effectively within an animal technology facility. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Diploma of Animal Technology: Graded - Case Studies, Written tasks. Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMATE302A CARRY OUT INSTITUTION CONTAINMENT AND EXCLUSION PROCEDURES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of carrying out institution containment and exclusion procedures that are designed to exclude pathogenic organisms from entering an aseptic site and to contain organisms in a particular site. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no text required

Assessment: Diploma of Animal Technology: Graded - Projects Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMATE303A PREPARE FOR AND MONITOR ANAESTHESIA IN ANIMALS

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of preparing for and monitoring anaesthesia in animals for non-surgical and tissue collection procedures under supervision and would aim to minimise the pain of an animal during the procedure and/or to minimise the risk to the operator during the procedure. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.

Required Reading:no required text

Assessment: Diploma of Animal Technology: Graded - Practical assessment and observation, written test, assignments, verbal questions. Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMATE304A CONDUCT NONSURGICAL PROCEDURES ON ANIMALS

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of conducting non-surgical procedures required to administer substances and take tissue and fluid samples for clinical trial project research purposes. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.

Required Reading:no required text

Assessment: Diploma of Animal Technology: Graded - Practical assessment, written questions, written tests, case studies Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMATE305A CONDUCT EUTHANASIA OF RESEARCH ANIMALS

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of euthanasing research animals under supervision. It has been developed specifically for animal technicians working with and caring for animals used within an animal technology biomedical research or production environment for scientific purposes and teaching purposes. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
Required Reading:no required text
Assessment: Diploma of Animal Technology: Graded - Practical assessment, written tests, assignments, case studies Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMATE501A MANAGE COMPLIANCE IN ANIMAL TECHNOLOGY
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of practising and promoting animal welfare and ethical standards to others in animal technology workplaces and ensuring work practices, documentation and attitudes meet legislative, regulatory and workplace standards. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading:no required text
Assessment: Written questions, case studies, assignments, project.

ACMATE502A MANAGE AND MAINTAIN HEALTH OF RESEARCH ANIMALS
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the processes of managing the health of animals in a research environment according to the institution's standard operating procedures and relevant codes of practice. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading:no required text
Assessment: Written questions, assignments, practical observation

ACMATE503A CARRY OUT POST-MORTEM EXAMINATION OF A RESEARCH ANIMAL
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of conducting a post-mortem examination of a research animal for scientific purposes.
Required Reading:no required text
Assessment: Written questions, assignments, practical observation, cases studies.

ACMATE504A ADMINISTER ANAESTHESIA AND PERFORM SURGERY ON ANIMALS FOR SCIENTIFIC PURPOSES
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of preparing personnel, equipment, animals and the facility for anaesthesia and surgical procedures for scientific purposes.
Required Reading: No required text
Assessment: Practical observation, written questions, verbal questions, assignments.

ACMATE505A CARRY OUT ADVANCED BREEDING PROCEDURES
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of establishing breeding programs for multiple generation production lines, selecting and preparing animals for breeding and implementing breeding and post-mating procedures.
Required Reading: No required reading
Assessment: Practical observation, projects, written questions, case studies, third party evidence.

ACMATE507A MANAGE THE PARTURITION OF TRANSGENIC MICE OR RATS
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of stages of natural and caesarean births and management of transgenic mice or rat pups.
Required Reading: No required reading
Assessment: Practical observation, written questions, third party evidence.

ACMCAN308A RELEASE NATIVE ANIMALS TO NATURAL ENVIRONMENT
Locations: Werribee, Weekend workshop at Werribee campus and may include visits to wildlife parks..
Prerequisites: Nil.
Description: This unit of competency covers the process of preparing and successfully releasing native wildlife into their natural environment.
Required Reading: No text required.
Assessment: The evidence required to demonstrate competence in this unit must be relevant to workplace operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit. Assessors should ensure that candidates can: - prepare native animals for release - transport and release animals - monitor success of release program, where possible - maintain accurate records. The skills and knowledge required to release native animals to natural environment must be transferable to a range of work environments and contexts and include the ability to deal with unplanned events.

ACMCAS301A WORK EFFECTIVELY IN THE COMPANION ANIMAL INDUSTRY
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of working effectively on an individual basis and with others within the companion animal industry. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading:no required text
Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMCAS302A PROVIDE ADVICE ON COMPANION ANIMAL SELECTION AND GENERAL CARE
Locations: Werribee, Industry.
Prerequisites: Nil.
Description: This unit of competency covers the process of providing advice to customers on the appropriate selection of companion animals, and on their housing, nutritional and other general care requirements.
Required Reading: No required text
Assessment: The evidence required to demonstrate competence in this unit must be relevant to workplace operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit. Assessors should ensure that candidates can: - provide information

and advice of the housing, nutrition, environmental and general maintenance requirements of a range of companion animals - comply with relevant legislation, regulations and codes of practice, including animal welfare, OHS, sale and transport of companion animals - build relationships and communicate effectively with clients to advise on the suitability of a particular companion animal breed or species to meet their needs -maintain records and follow-up with customers as required.

ACMCAS305A MAINTAIN AQUASCAPES AND AQUATIC ANIMALS

Locations: Werribee, Industry.

Prerequisites: Nil.

Description: This unit of competency covers the process of monitoring illness and/or abnormal behaviour in aquatic animals, collecting and analysing water samples and administering treatments.

Required Reading: No required text

Assessment: The evidence required to demonstrate competence in this unit must be relevant to workplace operations and satisfy all of the requirements of the performance criteria, required skills and knowledge and the range statement of this unit. Assessors should ensure that candidates can: - monitor and maintain effective aquatic animal health-management practices in accordance with organisational policies and procedures - comply with relevant legislation, regulations and codes of practice, including animal welfare and OHS - identify aquatic animals showing signs of poor health, injuries or abnormal behaviour - administer authorised aquatic animal treatments and implement preventative medicine programs - collect and test water samples and adjust water quality to suit the aquascape and species requirements as required - maintain records and required documentation. The skills and knowledge required to maintain aquascapes and aquatic animals must be transferable to a range of work environments and contexts and include the ability to deal with unplanned events.

ACMCAS306A PROVIDE GROOMING SERVICES FOR COMPANION ANIMAL COMFORT

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of providing animal grooming services for companion animals to maintain/restore animal comfort within an established grooming environment.

Required Reading:no required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMCAS307A PROVIDE COMPANION ANIMAL HYDRO-BATHING SERVICES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of providing hydro-bathing services for companion animals following industry recognised bathing procedures.

Required Reading: No required text

Assessment: Practical Obervation, written questions, oral presentation

ACMCAS401A MANAGE COMPLIANCE IN THE COMPANION ANIMAL INDUSTRY

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of managing compliance within the companion animal industry, including the provision of high-level advice to clients on companion animal management and housing needs, maintaining external relationships and keeping records. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Case studies, Scenrio assessment and written questions.

ACMCAS402A MANAGE AND MAINTAIN AVIARIES AND BIRD ROOMS

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of determining the housing and maintenance needs of specific species and breeds of birds, maintaining enclosures, detecting and controlling pests and reporting notifiable diseases.

Required Reading:no required reading

Assessment: Presentation, written and verbal tasks

ACMCAS407A PROVIDE PROFESSIONAL COMPANION ANIMAL GROOMING SERVICES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of providing professional pattern and style grooming services for companion animals.

Required Reading: No required text

Assessment: Practical observation, role plays, written questions, verbal questions.

ACMCAS409A PROVIDE TRAINING ADVICE TO COMPANION ANIMAL OWNERS

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of developing, conducting and reviewing training plans and programs for companion animals for their owners.

Required Reading:no required text

Assessment: Practical Obervation, assessment, portfolio

ACMCAS410A CONDUCT COMPANION ANIMAL TRAINING CLASSES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of developing, conducting and reviewing training classes for companion animals and their owners.

Required Reading:no required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMGAS201A WORK IN THE ANIMAL CARE INDUSTRY

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the terminology, culture and working conditions of an animal care workplace when working on an individual basis and with others. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading: No required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMGAS202A PARTICIPATE IN WORKPLACE COMMUNICATION

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of effectively participating in

workplace communications in an animal care and management environment. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading: no required text
Assessment: Practical Obervation, role plays, written tests, workplacment and portfolio

ACMGAS203A COMPLETE ANIMAL CARE HYGIENE ROUTINES
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the responsibilities and procedures required to provide daily care of animals, including the cleaning of animal housing and grooming or cleaning of animals under supervision. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading: no required text
Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMGAS204A FEED AND WATER ANIMALS
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of preparing, presenting and distributing food and water for animals under supervision and according to workplace diet requirements. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading: no required text
Assessment: Practical Obervation, written questions, oral presentation

ACMGAS205A ASSIST IN HEALTH CARE OF ANIMALS
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of providing assistance to experienced staff in the capture, restraint and assessment of animals and the preparation, application and documentation of treatments. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading: no required text
Assessment: Practical Obervation, written questions, oral presentation

ACMGAS206A PROVIDE BASIC FIRST AID FOR ANIMALS
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of providing essential first aid for animals by recognising and responding to an emergency using basic first aid measures. The first aider is not expected to deal with complex casualties or incidents, but to provide an initial response where first aid is required.
Required Reading: no required text
Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMGAS207A PROVIDE RECEPTION SERVICES FOR AN ANIMAL CARE FACILITY
Locations: Werribee, Industry.
Prerequisites: Nil.
Description: This unit of competency covers the process of coordinating client (animal owner) appointments or bookings and undertaking office administration and basic financial tasks for an animal care facility.
Required Reading: No text required

ACMGAS208A SOURCE INFORMATION FOR ANIMAL CARE NEEDS
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the processes required to gather information on medications and services for animals and relate these to individual animal requirements and audience needs. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading: no required text
Assessment: Written questions, role play, oral presentation, portfolio.

ACMGAS209A PROVIDE INFORMATION ON COMPANION ANIMALS, PRODUCTS AND SERVICES
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of providing basic information to customers on companion animal training, grooming and/or breeding establishments, and on products and services in a range of companion animal settings.
Required Reading: no required text
Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMGAS210A PREPARE FOR AND CONDUCT A TOUR OR PRESENTATION
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of preparing for a tour or presentation within an animal care facility and conducting it to meet the needs of a wide range of audiences.
Required Reading: No required text
Assessment: assessmnet may include practical assessmnet; class activities; workplace presentations

ACMGAS301A MAINTAIN AND MONITOR ANIMAL HEALTH AND WELLBEING
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of following animal health management practices to monitor animal health via daily observations of behaviour and condition. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.
Required Reading: no required text
Assessment: Diploma of Animal Technology: Graded - Practical assessment, written tests, assignment Certificate IV: Practical assessment, written tests, assignment Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMGAS302A PROVIDE ENRICHMENT FOR ANIMALS
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of providing behavioural management and enrichment to stimulate, replenish and maintain appropriate behavioural patterns of animals. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Diploma of Animal Technology: Graded - written tests, practical observation, case study assignments, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMGAS303A PLAN FOR AND PROVIDE FOR NUTRITION REQUIREMENTS FOR ANIMALS

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of calculating rations based on animal species needs and availability of feedstuffs. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Diploma of Animal Technology: Graded - written tests, practical observation, case study assignments, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMGAS304A CARRY OUT SIMPLE BREEDING PROCEDURES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of planning mating and breeding, parturition or hatching and weaning of animals under supervision. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Diploma of Animal Technology: Graded - Project, written tests, assignments, case studies, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMGAS306A ASSIST WITH CONDITIONING ANIMALS

Locations: Werribee, Industry.

Prerequisites: Nil.

Description: This unit of competency covers the process of conditioning animals in order to modify their behaviour through assisting with formulating and demonstrating a conditioning plan based on operant conditioning techniques.

Required Reading: No required text

Assessment: Practical observation, case studies, scenarios

ACMINF301A COMPLY WITH INFECTION CONTROL POLICIES AND PROCEDURES IN ANIMAL WORK

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process required to comply with infection control policies and procedures in animal care workplaces and relevant field locations. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Practical Obervation, role plays, written tests, workplacment and portfolio

ACMMIC401A IMPLANT MICROCHIP IN CATS AND DOGS

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of competently and aseptically performing microchip implantation procedures on cats and dogs, with minimum discomfort to the animal, for identification and traceability purposes.

Required Reading: No required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMOHS201A PARTICIPATE IN OCCUPATIONAL HEALTH AND SAFETY PROCESSES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process required for an entry level employee to participate in occupational health and safety (OHS) processes in the workplace, in order to ensure their own health and safety at work, as well as that of others in the workplace who may be affected by their actions. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading: No required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMOHS301A CONTRIBUTE TO OHS PROCESSES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process required by an employee to contribute to occupational health and safety (OHS) processes where there is responsibility for own work outputs and possibly limited responsibility for the work output of others. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Practical Obervation, role plays, written tests, workplacment and portfolio

ACMOHS401A MAINTAIN OHS PROCESSES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process required by an employee with supervisory responsibilities, to maintain organisational occupational health and safety (OHS) processes. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Case Studies, scenarios and written questions.

ACMOHS501A MANAGE OHS PROCESSES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process required by an individual responsible for ongoing management of occupational health and safety (OHS) within an area of management responsibility, where the OHS management processes have been set up by other persons, either internal or external to the organisation. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Written questions, case studies, assignments.

ACMSPE301A PROVIDE BASIC CARE OF AMPHIBIANS

Locations: Werribee.

Prerequisites: Nil.
Description: This unit of competency covers the process of identifying amphibians and their behavioural and physical needs, providing daily care requirements, assisting with behaviour requirements and basic preventative health measures.
Required Reading: No required text
Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMSPE302A PROVIDE BASIC CARE OF BIRDS

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of identifying birds and their behavioural and physical needs, providing daily care requirements, assisting with behavioural requirements and basic preventative health measures.
Required Reading: No required text
Assessment: Written and verbal tests, case studies, scenarios, and practical observation. Certificate IV In Veterinary Nursing: also has a portfolio component.

ACMSPE303A PROVIDE BASIC CARE OF COMMON NATIVE MAMMALS

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of identifying common native mammals, their behavioural and physical needs, providing daily care requirements, assisting with behaviour requirements and basic preventative health measures.
Required Reading: no required text
Assessment: Diploma of Animal Technology: Graded - Practical observation, written tests, asiignments, case studies, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMSPE304A PROVIDE BASIC CARE OF DOGS

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of identifying dogs and their behavioural and physical needs, providing daily care requirements, assisting with behavioural requirements and basic preventative health measures.
Required Reading: no required text
Assessment: Diploma of Animal Technology: Graded - Practical observation, written tests, asiignments, case studies, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMSPE305A PROVIDE BASIC CARE OF DOMESTIC CATS

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of identifying domestic cats and their behavioural and physical needs, providing daily care requirements, assisting with behavioural requirements and basic preventative health measures.
Required Reading: no required text
Assessment: Diploma of Animal Technology: Graded - Practical observation, written tests, asiignments, case studies, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMSPE307A PROVIDE BASIC CARE OF FRESHWATER FISH

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of identifying freshwater fish and their behavioural and physical needs, providing daily care requirements as well as assisting with behavioural requirements and preventative health measures.
Required Reading: no required text
Assessment: Diploma of Animal Technology: Graded - Practical observation, written tests, asiignments, case studies, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMSPE310A PROVIDE BASIC CARE OF MAMMALS

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of identifying mammals and their behavioural and physical needs, providing daily care requirements, assisting with behavioural and basic preventative health measures.
Required Reading: No required text
Assessment: Diploma of Animal Technology: Graded - Practical observation, written tests, asignments, case studies, worksheets. Certificate IV in Companion Animal Services: Written and verbal tests, case studies, scenarios, and practical observation. Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMSPE311A PROVIDE BASIC CARE OF NON-VENOMOUS REPTILES

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of identifying reptiles and their behavioural and physical needs, providing daily care requirements for non-venomous reptiles as well as assisting with behavioural requirements and preventative health measures.
Required Reading: no required text
Assessment: Diploma of Animal Technology: Graded Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks, Vet Nursing: Portfolio

ACMSPE312A PROVIDE BASIC CARE OF RODENTS AND RABBITS

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of identifying rodents and rabbits and their behavioural and physical needs, providing daily care requirements, assisting with behavioural requirements and basic preventative health measures. Licensing, legislative, regulatory or certification requirements may apply to this unit in relation to keeping rodents and rabbits. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
Required Reading: no required text
Assessment: Diploma of Animal Technology: Graded - written tests, practical observation, case study assignments, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMSUS201A PARTICIPATE IN ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES

Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process required to measure current resource use effectively and to carry out improvements, including those that will reduce the negative environment impacts of work practices. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

ACMSUS301A IMPLEMENT AND MONITOR ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process required to analyse the workplace in an effective manner in relation to environmentally sustainable work practices and to implement improvements and monitor their effectiveness

Required Reading:no required text

Assessment: Diploma of Animal Technology: Graded Certificate IV: Case studies and workbook. Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

ACMVET201A CARRY OUT VET NURSING RECEPTION DUTIES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of compiling patient (animal) and client (animal owner) histories, maintaining records and consulting the veterinarian as required. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of publication.

Required Reading:no required text

Assessment: Practical Obervation, role plays, written tests, workplacment and portfolio

ACMVET202A CARRY OUT DAILY CLINIC ROUTINES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of treating patients (animals) on a daily basis, maintaining clinic hygiene and assisting with inventory and clinic security. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.

Required Reading:no required text

Assessment: Practical Obervation, written questions, oral presentation

ACMVET203A ASSIST WITH SURGERY PREPARATION

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of assisting with the preparation of patients (animals) and the theatre for surgery, providing pre- and post-operative patient care and cleaning surgical and theatre equipment in a veterinary clinic. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.

Required Reading:no required text

Assessment: Practical obervation, Workbook quesitons, Workplacement, Portfolio.

ACMVET401A COORDINATE PATIENT ADMISSION AND DISCHARGE

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of coordinating patient admission and discharge. It also includes providing initial veterinary nursing care to patients (animals) and grief support to clients (animal owners). Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.

Required Reading:no required text

Assessment: Practical Obervation, role plays, written tests, workplacment and portfolio

ACMVET402A APPLY IMAGING ROUTINES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of implementing and completing imaging routines, in accordance with established industry sequences and clinic policies and procedures, and follow specific instructions from the veterinarian. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.

Required Reading:no required text

Assessment: Practical observation, assignments, workplacment.

ACMVET403A PERFORM CLINICAL PATHOLOGY PROCEDURES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of collecting biological samples and performing pathology procedures. The integrity of the sample must be maintained in accordance with veterinarian instructions when conducting clinic examinations and in preparing consignments to diagnostic laboratories. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.

Required Reading:no required text

Assessment: Practical observation, assignments, workplacment.

ACMVET404A PERFORM CLINICAL OFFICE PROCEDURES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of maintaining veterinary supplies, controlling stock, maintaining clinic accounts and preparing and processing clinic correspondence. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.

Required Reading:no required text

Assessment: Practical Obervation, role plays, written tests, workplacment and portfolio

ACMVET405A CARRY OUT SURGICAL NURSING ROUTINES

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the process of preparing the surgical environment and providing total support for the surgeon. The unit describes the skills and knowledge required to prepare for, and provide support during and after, routine

and non-routine surgical procedures, including monitoring patients while they are under anaesthesia. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
Required Reading:no required text
Assessment: Practical obervation, Workbook quesitons, Workplacement, Portfolio.

ACMVET406A NURSING ANIMALS
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of providing high quality nursing care for all patients (animals) treated or housed at the clinic. It includes providing advice to clients (owners), monitoring animals and providing animal first aid as required. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
Required Reading:no required text
Assessment: Practical obervation, Workbook quesitons, Workplacement, Portfolio.

ACMVET407A CARRY OUT MEDICAL NURSING ROUTINES
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of providing the skills to implement medical nursing routines, including the preparation and handling of patients (animals) and equipment for specific routines. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
Required Reading:no required text
Assessment: Practical obervation, Workbook quesitons, Workplacement, Portfolio.

ACMVET408A COORDINATE AND PERFORM THEATRE ROUTINES
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of preparing, cleaning and maintaining theatre and equipment as well as preparing personnel for the performance of surgical procedures. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
Required Reading:no required text
Assessment: Practical obervation, Workbook quesitons, Workplacement, Portfolio.

ACMVET409A PROVIDE SPECIFIC ANIMAL CARE ADVICE
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the process of providing advice to clients (owners) about animal care, nutrition, behaviour and products. All advice must be provided in a competent manner and in accordance with clinic policies and procedures. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
Required Reading:no required text
Assessment: Written questions, role play, oral presentation, portfolio.

ACMVET410A CARRY OUT VET NURSING DENTAL PROCEDURES
Locations: Werribee.
Prerequisites: Nil.
Description: This unit of competency covers the processes of performing a dental prophylaxis and assisting with simple extractions. Licensing, legislative, regulatory or certification requirements may apply to this unit. Therefore, it will be necessary to check with the relevant state or territory regulators for current licensing, legislative or regulatory requirements before undertaking this unit.
Required Reading:no required text
Assessment: Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

AHB5205 PROJECT MANAGEMENT AND PEOPLE
Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit of study examines the role of people in the planning, design and implementation of projects.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students will be able to:

- Distinguish between audiences that are external to the project and audiences that are internal to the project;
- Explain how project teams can be established and roles allocated;
- Identify the different structures that can be created to ensure both intra and inter-team communication;
- Develop tools and techniques for motivating staff and ensuring high levels of morale in project teams;
- Manage grievances and conflict in a team setting provide space for team members with special skills and abilities introduce incentives and rewards to ensure ongoing efficiency.

Class Contact: One two-hour lecture and one one-hour tutorial.
Required Reading: Kerzner, H 2003 Project management: a systems approach to planning, scheduling and controlling, 8th edn, John Wiley and Sons. Brown, D & Harvey, D 2006, An experiential approach to organisational development, 7th edn, Pearson Education.
Assessment: Mid-semester test on structures for managing projects 30%; Quiz on allocating tasks and responsibilities 10%; Research paper on staff motivation and morale for effective project management 30%; Case report on team building and managing diversity 30%.

AUMATA5008 PRODUCE DRAWINGS MANUALLY
Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit describes the application of the required skills and knowledge to produce drawings, using manual drafting techniques, required in the design, development and production of bus/truck/trailers.
Required Reading: Refer to Learning and Assessment Plan
Assessment: Evidence of the following is essential: - compliance with relevant legislative, regulations, standards, codes of practice and establish safe practices and organisation policies and procedures for managing personal work

priorities - maintaining a working knowledge of current work systems and practices - working and communicating effectively and positively with others involved in the work - applying, within authority, the requirements of the job or work role in relation to: - achieving production goals - achieving work quality goals - responding positively to changing work requirements - contributing effectively to cost reduction initiatives - effectively applying problem solving techniques - modify activities to cater for variations in organisation context and environment - clarify manual drafting requirements - select tools, equipment and media - make any required measurements - prepare drawings manually - check drawings - document drawings - store drawings - paper based / electronic.

BSBPMG407A APPLY RISK MANAGEMENT TECHNIQUES

Locations: Industry.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to assist with aspects of risk management within a project. It specifically involves assisting the project team to plan for, control and review risks associated with the project.

Required Reading: Stephen Hartley (2003). Project management - A competency-based approach. Australia: Pearson/ Prentice Hall. Will Baker (2005). Manage projects effectively. Australia: Pearson/ Prentice Hall.

Assessment: Oral and written questioning Oral presentation Practical demonstration Research assignment Written report

BSBPUR501C DEVELOP, IMPLEMENT AND REVIEW PURCHASING STRATEGIES

Locations: Footscray Nicholson, Industry.

Prerequisites:N/A

Description: This unit specifies the outcomes required to develop, implement and evaluate an organisation's purchasing strategies, and implement improvements to those strategies.

Required Reading:VU Produced Workbook

Assessment: Evidence of the following is essential: - development of purchasing objectives and strategies for an organisation - implementation of those purchasing strategies in an organisation - evaluation and implementation of improvements to purchasing strategies in an organisation. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks.

BSBPUR502B MANAGE SUPPLIER RELATIONSHIPS

Locations: Footscray Nicholson, Industry.

Prerequisites: Nil.

Description: This unit specifies the outcomes required to manage relationships with suppliers of larger purchases or multiple smaller purchases, where the relationship is of some significance to the organisation. It covers managing purchasing agreements, resolving disagreements with suppliers, finalising agreements, and reviewing the performance of suppliers.

Required Reading:-

Assessment: Assessment methods will be designed to reinforce and to extend knowledge, skills and their application in accordance with requirements of each unit of competency's learning outcomes, performance criteria, range statement and the relevant employability skills. A range of assessment methods will be designed to facilitate learning, transfer knowledge to work practices and provide evidence of competency, including: setting of projects and work based practical tasks, written objective tests, short and extended answers, oral tests/technical interviews, demonstrations, presentations, research tasks, group and individual activities.

BSBPUR504B MANAGE A SUPPLY CHAIN

Locations: Footscray Nicholson, Industry.

Prerequisites: Nil.

Description: This unit specifies the outcomes required to manage a supply chain, including the relationships between an organisation and its supply and demand partners along the chain. It covers implementing a demand driven supply chain management strategy, managing the supply chain, and evaluating and improving supply chain effectiveness.

Required Reading:-

Assessment: Assessment methods will be designed to reinforce and to extend knowledge, skills and their application in accordance with requirements of each unit of competency's learning outcomes, performance criteria, range statement and the relevant employability skills. A range of assessment methods will be designed to facilitate learning, transfer knowledge to work practices and provide evidence of competency, including: setting of projects and work based practical tasks, written objective tests, short and extended answers, oral tests/technical interviews, demonstrations, presentations, research tasks, group and individual activities.

CPCCBC5001A APPLY BUILDING CODES AND STANDARDS TO THE CONSTRUCTION PROCESS FOR MEDIUM RISE BUILDING PROJECTS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to access, interpret and apply relevant building codes and standards applicable to the construction processes of medium rise commercial and wide span buildings (medium rise licensing classification with reference to Class 1 and 10 construction, Class 2 and 3 to a maximum of 3 storeys, Class 4 to 9 to a maximum of 3 storeys, not including Type A construction). To successfully construct medium rise buildings requires a thorough knowledge of the purpose and content of the Building Code of Australia (BCA), coupled with the ability to interpret other codes and standards related to a specific building.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5001B APPLY BUILDING CODES AND STANDARDS TO THE CONSTRUCTION PROCESS FOR MEDIUM RISE BUILDING PROJECTS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to access, interpret and apply relevant building codes and standards applicable to the construction processes of medium rise commercial and wide span buildings (medium rise licensing classification with reference to Classes 1 and 10 construction, Classes 2 and 3 to a maximum of 3 storeys, and Classes 4 to 9 to a maximum of 3 storeys, not including Type A construction).

Required Reading: Australian Standards

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5002A MONITOR COSTING SYSTEMS ON MEDIUM RISE BUILDING AND CONSTRUCTION PROJECTS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to monitor building or construction costing systems. The processes and practices involved in supervising and monitoring costing systems result in the ongoing maintenance of cost control and the production of expenditure schedules and other arrangements, which ensure contracts or projects remain on budget. In order to achieve the outcomes for this unit, knowledge of relevant legislation, codes and standards, industry estimating and costing systems, and financial principles is required.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5003A SUPERVISE THE PLANNING OF ON-SITE MEDIUM RISE BUILDING OR CONSTRUCTION WORK

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to supervise the planning process and organisation of on-site building or construction work projects up to and including medium rise commercial and wide span buildings (medium rise licensing classification with reference to Class 1 and 10 construction, Class 2 and 3 to a maximum of 3 storeys, Class 4 to 9 to a maximum of 3 storeys, not including Type A construction). Successful supervision of planning and organisation requires effective interpretation of contractual and planning requirements and development of strategies for using human and physical resources effectively in order to comply with contractual obligations. In order to achieve the outcomes for this unit, knowledge of relevant building and construction planning practices, state or territory building and construction codes, standards and regulations and human resource principles and practices is required.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5004A SUPERVISE AND APPLY QUALITY STANDARDS TO THE SELECTION OF BUILDING AND CONSTRUCTION MATERIALS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to supervise the systems through which materials are selected, acquired and stored on site for building or construction work up to and including medium rise projects. It ensures the delivery to the site of materials that meet contract specifications and service requirements for commercial projects. To achieve the outcomes for this unit, knowledge of relevant building construction materials and technologies, environmental effects on materials and testing procedures is required.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5005A SELECT AND MANAGE BUILDING AND CONSTRUCTION CONTRACTORS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to select and manage building and construction contractors. It covers the processes and practices involved in supervising the systems through which the selection and management of subcontract resources occurs within the organisation, and through which subcontracting needs are identified and quantified. In order to achieve the outcomes for this unit, knowledge of relevant industry legislation, standards and codes, the subcontracting system and industrial relations processes is required.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5006A APPLY SITE SURVEYS AND SET-OUT PROCEDURES TO MEDIUM RISE BUILDING PROJECTS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply site surveys and set-out procedures to medium rise building and construction projects. It addresses the skills and practices required to measure, record and interpret data using measuring and levelling equipment and to set out building projects. The ability to operate specific surveying equipment and apply calculations and knowledge of the Building Code of Australia (BCA) and Australian standards are essential.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5006B APPLY SITE SURVEYS AND SET-OUT PROCEDURES TO MEDIUM RISE BUILDING PROJECTS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply site surveys and set-out procedures to medium rise building and construction projects. It addresses the skills and practices required to measure, record and interpret data using measuring and levelling equipment and to set out building projects. The ability to operate specific surveying equipment and apply calculations and knowledge of the Building Code of Australia (BCA) and Australian standards are essential.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment:A person who demonstrates competency in this unit must be able to provide evidence of the ability to: - accurately apply survey and levelling principles relating to performance of site set-out - comply with OHS and organisational quality procedures and processes - apply and interpret relevant documentation, codes and legislation - use levelling devices to survey and set out building projects - identify typical faults and problems and take necessary action taken to rectify - identify hazard categories according to Australian standards, BCA and specifications.

CPCCBC5007A ADMINISTER THE LEGAL OBLIGATIONS OF A BUILDING OR CONSTRUCTION CONTRACT

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to administer the legal obligations of a building or construction contract. It is concerned with licensing and/or builders' registration and other legislative matters as appropriate, and administering the systems through which the obligations of complying with legislation are fulfilled. In order to achieve the outcomes for this unit, knowledge of relevant industry legislation, codes, standards, regulations, licensing, employee awards, agreements, OHS, taxation and insurance is required.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5008A APPLY STRUCTURAL PRINCIPLES TO THE CONSTRUCTION OF MEDIUM RISE BUILDINGS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply structural principles to the building of medium rise buildings. The design and construction of medium rise buildings requires the input of a range of skilled professionals, including architects and engineers. The building and construction professional plays a significant role within this project team and requires the ability to communicate effectively with building design professionals, and develop sound and safe practices in relation to structural procedures on site.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5009A IDENTIFY SERVICES LAYOUT AND CONNECTION METHODS TO MEDIUM RISE CONSTRUCTION PROJECTS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to identify drawings, specifications and requirements for services in a range of medium rise and wide span commercial projects. It requires an ability to identify and evaluate differing methods and services in accordance with building regulations and standards.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5010A MANAGE CONSTRUCTION WORK

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to manage construction work and/or projects, which may involve fulfilling single or multi-site commercial contractual obligations. To successfully manage construction projects requires knowledge of relevant industry legislation, codes, standards, methods, procedures and practices as well as the ability to communicate effectively with others.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5010B MANAGE CONSTRUCTION WORK

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to manage construction work and/or projects, which may involve fulfilling single or multi-site commercial contractual obligations. To successfully manage construction projects requires knowledge of relevant industry legislation, codes, standards, methods, procedures and practices as well as the ability to communicate effectively with others.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5011A MANAGE ENVIRONMENTAL MANAGEMENT PRACTICES AND PROCESSES IN BUILDING AND CONSTRUCTION

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to manage environmental management practices and processes in building and construction, as part of the organisation's overall management system. To successfully manage practices and processes requires knowledge of current trends in environmental practices and methodologies, statistical analysis and legislative requirements.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5012A MANAGE THE APPLICATION AND MONITORING OF ENERGY CONSERVATION AND MANAGEMENT PRACTICES AND PROCESSES

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to manage the application and monitoring of energy conservation and management practices and processes within the building and construction industry. Successful application of the unit requires knowledge of energy management practices and methodologies, statistical analysis, current trends and factors in energy conservation, and legislative and regulatory requirements.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5013A DEVELOP PROFESSIONAL TECHNICAL AND LEGAL REPORTS ON BUILDING AND CONSTRUCTION PROJECTS

Locations: Melton.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to develop professional technical and legal reports on buildings and commercial construction projects. The unit requires knowledge of relevant legislation, codes, standards and regulations, contract documentation and construction planning and practices, as well as the ability to communicate effectively.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCBC5018A APPLY STRUCTURAL PRINCIPLES TO THE CONSTRUCTION OF MEDIUM RISE BUILDINGS

Locations: Sunshine.

Prerequisites:CPCCBC5001B - APPLY BUILDING CODES AND STANDARDS TO THE CONSTRUCTION PROCESS FOR MEDIUM RISE BUILDING PROJECTS

Description: This unit of competency specifies the outcomes required to apply structural principles to the building of medium rise buildings. The design and construction of medium rise buildings require the input of a range of skilled professionals, including architects and engineers. The building and construction professional plays a significant role within this project team and requires the ability to communicate effectively with building design professionals, and develop sound and safe practices in relation to structural procedures on site.

Required Reading: Australian Standards

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5001A ASSESS THE CONSTRUCTION OF DOMESTIC SCALE BUILDINGS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to assess the construction of domestic scale buildings and those of a similar loading, construction and size, such as small industrial, commercial or public buildings. It includes evaluation and identification of appropriate construction methods, and identification of required standards and services according to relevant legislation, design and maintenance specifications.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5002A EVALUATE MATERIALS FOR CONSTRUCTION OF DOMESTIC SCALE BUILDINGS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to evaluate and select materials for domestic scale buildings. It relates to a range of building materials, including concrete, glass, timber, plastic and plasterboard in accordance with the Building Code of Australia (BCA).

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5003A PRODUCE WORKING DRAWINGS FOR RESIDENTIAL BUILDINGS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to read and interpret plans and specifications and to undertake basic architectural drafting of conventional residential structures. It includes the production of two and three-dimensional (3-D) drawings in accordance with standard industry drawing practice and to a level suitable for building permit approval.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5004A APPLY LEGISLATION TO URBAN DEVELOPMENT AND BUILDING CONTROLS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to research, interpret and apply appropriate land use and urban development to a conventional building project in compliance with relevant legislation and the Building Code of Australia (BCA).

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5005A APPLY FOOTING AND GEOMECHANICAL DESIGN PRINCIPLES TO DOMESTIC SCALE BUILDINGS

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency specifies the outcomes required to apply footing and geomechanical design principles to domestic scale buildings or those of a similar loading, construction and size, such as small industrial, commercial or public buildings. It includes the evaluation and distribution of soil types, and identification of appropriate footing systems and maintenance requirements for foundation components of the project.
Required Reading: Australian Standards ABCB Building Code of Australia
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5006A ASSESS CONSTRUCTION FAULTS IN RESIDENTIAL BUILDINGS

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency specifies the outcomes required to identify construction faults in residential buildings. It includes the identification and evaluation of construction problems and determination of alternative building methods in accordance with legislative requirements.
Required Reading: Australian Standards ABCB Building Code of Australia
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5007A UNDERTAKE SITE SURVEYS AND SET-OUT PROCEDURES FOR BUILDING PROJECTS

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency specifies the outcomes required to undertake site surveys and set out procedures for civil and residential building projects. It includes the use of basic measuring and levelling equipment, recording and interpretation of data, and evaluation of and compliance with relevant legislation.
Required Reading: Australian Standards ABCB Building Code of Australia
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5008A APPLY BUILDING CONTROL LEGISLATION TO BUILDING SURVEYING

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency specifies the outcomes required to research, interpret and apply building control legislation for use in building surveying activities relating to domestic scale buildings and structures. It includes the evaluation of the Australian common law system and the various sources of law applicable to building surveying activities and the identification and application of the professional code of ethics required for the assessment and inspection of buildings.
Required Reading: Australian Standards ABCB Building Code of Australia
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5009A ASSESS THE IMPACT OF FIRE ON BUILDING MATERIALS

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency specifies the outcomes required to assess theimpact of fire on building materials. It includes the research, analysis and reporting of testing conducted on a range of building materials and structures in differing circumstances to determine combustion, flammability, heat transfer, burning conditions, building material behaviour, fire loads of buildings and fire resistance.
Required Reading: Australian Standards ABCB Building Code of Australia
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5010A INTERACT WITH CLIENTS IN A REGULATED ENVIRONMENT

Locations: Newport.
Prerequisites: Nil.
Description: This unit of competency specifies the outcomes required to initiate and undertake consultation with individuals and groups in regard to building surveying practices. It includes the identification and implementation of appropriate interaction models according to community demographics, cultural considerations and social stratification; the analysis and evaluation of data to enable informed decision-making; and the presentation of findings to clients and other appropriate stakeholders.
Required Reading: Australian Standards ABCB Building Code of Australia
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5011A APPLY BUILDING CODES AND STANDARDS TO RESIDENTIAL BUILDINGS

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency specifies the outcomes required to ensure that the building process complies with the Building Code of Australia (BCA) and relevant Australian standards. The unit applies to residential buildings and includes the evaluation and interpretation of building requirements, classification of buildings according to the BCA criteria and strategies for compliance.
Required Reading: Australian Standards ABCB Building Code of Australia
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5012A ASSESS TIMBER-FRAMED DESIGNS FOR ONE AND TWO STOREY BUILDINGS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to select structural members for a timber-framed domestic building up to and including two storeys. It includes the evaluation of plans and specifications, and selection of structural members for ceiling and roof framing, timber wall frames, timber stumps, floor bearers and joists. It requires compliance with all relevant legislation, the Building Code of Australia (BCA) and Australian standards.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5013A APPLY PRINCIPLES OF ENERGY EFFICIENT DESIGN TO BUILDINGS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply energy efficient design to buildings. It includes the evaluation of building designs to establish suitable forms of construction and the identification of appropriate energy consumption practices for incorporation into design briefs.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV5014A APPLY BUILDING SURVEYING PROCEDURES TO RESIDENTIAL BUILDINGS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to assess residential buildings for compliance with building legislation. It includes the evaluation and interpretation of plans, progressive inspection of building work, preparation of reports and compliance with legislative requirements.

Required Reading: Australian Standards ABCB Building Code of Australia

CPCCSV5015A ASSESS STRUCTURAL REQUIREMENTS FOR DOMESTIC SCALE BUILDINGS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to assess the structural requirements of domestic scale buildings and those of a similar loading, construction and size, such as small industrial, commercial or public buildings. It includes the application of design concepts to the selection, positioning and sizing of all structural members and materials that form a building structure.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6001A ASSESS THE CONSTRUCTION OF BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to assess the construction of buildings of up to three storeys and a maximum floor area of 2000 square metres. It includes evaluation and identification of appropriate construction methods and the identification of required standards and services according to relevant legislation, design and maintenance specifications.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6002A PRODUCE WORKING DRAWINGS FOR BUILDINGS UP TO THREE STOREYS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to read and interpret plans and specifications and to undertake architectural drafting of buildings up to three storeys and a maximum floor area not exceeding 2000 square metres. It includes the production of two and three-dimensional drawings in accordance with standard industry drawing practice and to a level suitable for building permit approval.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6003A ASSESS CONSTRUCTION FAULTS IN BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to identify construction faults in buildings up to three storeys and not exceeding a maximum floor area of 2000 square metres. It includes the identification and evaluation of construction problems and determination of alternative methods in accordance with legislative requirements.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6004A APPLY FOOTING AND GEOMECHANICAL DESIGN PRINCIPLES TO BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply footing and geomechanical design principles to buildings up to three storeys and not exceeding a maximum floor area of 2000 square metres. It includes the identification, classification, calculated positioning and sizing of all structural footing that form foundation components of the project.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6005A EVALUATE SERVICES LAYOUT AND CONNECTION METHODS FOR RESIDENTIAL AND COMMERCIAL BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to evaluate the layout of services and connection methods for residential and commercial buildings up to three storeys and not exceeding a maximum floor area of 2000 square metres. It includes the evaluation of cold and hot water supply, sewerage layout, electric and electronic installation requirements, smoke and fire preventative systems. It requires compliance with relevant legislation, Australian standards and the Building Code of Australia (BCA).

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6006A EVALUATE THE USE OF CONCRETE FOR RESIDENTIAL AND COMMERCIAL BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to evaluate and select concrete for commercial and residential buildings of up to three storeys and a maximum floor area of 2000 square metres. This unit relates primarily to the selection, maintenance and repair of concrete as a fundamental building material in accordance with the Building Code of Australia (BCA).

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6007A ASSESS STRUCTURAL REQUIREMENTS FOR BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to assess the structural requirements of buildings up to three storeys and with a maximum floor area not exceeding 2000 square metres. It includes the application of design concepts to the selection, positioning and sizing of all structural members and materials that form a building structure.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6008A APPLY BUILDING CODES AND STANDARDS TO BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to ensure the building process complies with the Building Code of Australia (BCA) and relevant Australian standards. It applies specifically to buildings up to three storeys and not exceeding a maximum floor area of 2000 square metres.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6009A IMPLEMENT PERFORMANCE-BASED CODES AND RISK MANAGEMENT PRINCIPLES FOR BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to implement performance-based codes, risk assessment and risk management principles to commercial and residential buildings up to three storeys and not exceeding a maximum floor area of 2000 square metres.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6010A APPLY FIRE TECHNOLOGY TO BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to evaluate smoke detection and fire prevention, protection and control systems for buildings up to three storeys and not exceeding a maximum floor area of 2000 square metres. It includes evaluation of firefighting equipment in buildings, integration of active and passive fire protection systems, and the determination of sprinkler and drencher requirements according to the Building Code of Australia (BCA), relevant legislation and Australian standards.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6011A APPLY LEGAL PROCEDURES TO BUILDING SURVEYING

Locations: St Albans.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to advise on building control activities in a court of law and present evidence in accordance with rules of evidence for civil and criminal trials. It includes the identification and application of the rules of statutory interpretation as they relate to building control legislation.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6012A FACILITATE COMMUNITY DEVELOPMENT CONSULTATION

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to initiate and undertake community consultation to facilitate supported community development. It includes the identification and implementation of appropriate consultation models according to community demographics, analysis and evaluation of data to enable informed decision-making, and the presentation of findings to appropriate stakeholders.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6013A COORDINATE BUILDING REFURBISHMENT

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to undertake standard refurbishment of buildings. It includes the evaluation of property/premises to establish the scope of work, preparation of inspection reports, and the engagement and coordination of subcontractors to carry out defined tasks.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6014A MANAGE AND PLAN LAND USE

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to plan and manage the use of land in a regulated building environment. It includes the evaluation of relevant legislation and application of land management practices and planning concepts required in conventional building developments.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6015A ANALYSE AND PRESENT BUILDING SURVEYING RESEARCH INFORMATION

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to gather, organise and present building surveying information using available systems. It includes the design, execution and documentation of research for a building surveying project.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCCSV6016A APPLY BUILDING SURVEYING PROCEDURES TO BUILDINGS UP TO THREE STOREYS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to assess medium rise building projects of up to three storeys and a maximum floor area of 2000 square metres for compliance with building and land use requirements. It includes the evaluation and interpretation of plans, progressive inspection of building work, preparation of reports and compliance with legislative requirements.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPCSUS5001A DEVELOP WORKPLACE POLICIES AND PROCEDURES FOR SUSTAINABILITY

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to develop and implement policies and procedures to continuously support resource efficiency and environmentally sustainable work practices.

Required Reading: Australian Standards ABCB Building Code of Australia

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

CPPDSM5022A IMPLEMENT ASSET MANAGEMENT PLAN

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to plan for the management of assets. It requires the ability to implement effective strategies to manage the operational, resource and maintenance needs of assets and to review and evaluate those strategies. The unit may form part of the licensing requirements for persons working in the property industry, including in the real estate, business broking, stock and station agency and property operations and development sectors, in those States and Territories where these are regulated activities.
Required Reading: Australian Standards ABCB Building Code of Australia
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

EB023 INTRODUCTION TO FINANCIAL MANAGEMENT

Locations: Sunshine.
Prerequisites: Nil.
Description: The purpose of this module is to provide competency based training at the paraprofessional level to enable participants to describe the processes of financial management in their enterprise, to perform relevant calculations and to prepare a budget for their enterprise.
Required Reading: No Required Reading

EB040 QUALITY CONTROL AND COMPUTING

Locations: Sunshine.
Prerequisites: Nil.
Description: Computerized manual development, quality manuals, procedure manuals, computer systems, process control data, statistical inputting, control data analysis, compute control.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB050 ENGINEERING PROJECT

Locations: Sunshine.
Prerequisites: Nil.
Description: To enable students to proceed from a client's brief to the preparation of design and development briefs, engineering solutions, design and detail drawings, written reports of tasks, processes and design outcomes, and the oral presentation of technical information.
Required Reading: No Required Reading

EB076 INTRODUCTION TO ENVIRONMENTAL MANAGEMENT

Locations: Sunshine.
Prerequisites: Nil.
Description:INTRODUCTION TO ENVIRONMENTAL MANAGEMENT
Required Reading: No Required Reading

EB701 ADVANCED MACHINE DESIGN

Locations: Sunshine.
Prerequisites: Nil.
Description:ADVANCED MACHINE DESIGN
Required Reading: No Required Reading

EB703 MACHINE DESIGN

Locations: Sunshine.
Prerequisites: Nil.
Description:MACHINE DESIGN
Required Reading: No Requried Reading

EB704 MECHANICAL DESIGN

Locations: Sunshine.
Prerequisites: Nil.
Description:MECHANICAL DESIGN
Required Reading: No Required Reading

EB705 PROJECT MECHANICAL DESIGN SYNTHESIS

Locations: Sunshine.
Prerequisites: Nil.
Description: Tender documents and contracting, engineering project specifications, client interaction (interpersonal skills), assessment of client need, report writing, preliminary design sketches, preliminary design calculations, general arrangement drawing component design, detailed drawings, final report, oral presentation to peers.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB711 THERMODYNAMICS 2

Locations: Sunshine.
Prerequisites: Nil.
Description:THERMODYNAMICS 2
Required Reading: No Required Reading

EB720 FLUID MECHANICS 2

Locations: Sunshine.
Prerequisites: Nil.
Description: To calculate the fluid flow and head loss in pipes and through open channels, determine operational aspects of a pump in a system and describe the basic types of fluid machinery.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB770 ROBOTICS 2

Locations: Sunshine.
Prerequisites: Nil.
Description: Select robots to meet industry requirements, interphase robots to peripherals, fault diagnosis, maintenance, machine interfacing.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB840 ADVANCED STRENGTH OF MATERIALS

Locations: Sunshine.
Prerequisites: Nil.
Description: Stress and Strain, Strain Energy, Beading and Shear in Beams, Combined Stresses, Buckling of Columns, Beam Deflection, Combined axial and Bending Stresses. Johnson or Euler formulae, Deflections, Impact loading.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB851 ENVIRONMENT ENGINEERING

Locations: Sunshine.
Prerequisites: Nil.

Description: Describe the major components of the Earth's environment and its pollution problems, the methods used for monitoring the environment, the principles for restoration programs, and undertake an environmental case study.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB852 FOUNDATIONS 1

Locations: Sunshine.
Prerequisites: Nil.
Description: FOUNDATIONS 1
Required Reading: No Required Reading

EB854 STORMWATER DRAINAGE

Locations: Sunshine.
Prerequisites: Nil.
Description: STORMWATER DRAINAGE
Required Reading: No Reading Requried

EB855 STRUCTURAL STEEL DESIGN 1

Locations: Sunshine.
Prerequisites: Nil.
Description: STRUCTURAL STEEL DESIGN 1
Required Reading: No Required Reading

EB858 WASTE WATER ENGINEERING B

Locations: Sunshine.
Prerequisites: Nil.
Description: To enable students to apply Local Authority guidelines in the design of a sewerage reticulation system, and to investigate the principles of sewage treatment and thence proportion the elements of a small plant.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB862 MINOR CIVIL ENGINEERING PROJECT B

Locations: Sunshine.
Prerequisites: Nil.
Description: To enable the student to produce a project on one, two, three or four specific topic areas. The student will proceed from a client's brief to the preparation of design and development briefs, engineering solutions, design and detail drawings, written reports of tasks, processes and design outcomes, and the oral presentation of technical information.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB863 MINOR CIVIL ENGINEERING PROJECT C

Locations: Sunshine.
Prerequisites: Nil.
Description: To enable the student to produce a project on one, two, three or four specific topic areas. The student will proceed from a client's brief to the preparation of design and development briefs, engineering solutions, design and detail drawings, written reports of tasks, processes and design outcomes, and the oral presentation of technical information.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB870 ENGINEERING SURVEYING 1

Locations: Sunshine.
Prerequisites: Nil.
Description: Opportunity to develop the skills and knowledge to determine the locations of engineering/construction elements from surveying and design information and accurately set out these elements.
Required Reading: No reading required
Assessment: As per accredited curriculum

EB874 STRUCTURAL STEEL DESIGN 2

Locations: Sunshine.
Prerequisites: Nil.
Description: STRUCTURAL STEEL DESIGN 2
Required Reading: No Required Reading

ECB1111 INTRODUCTION TO COMPUTER SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit will introduce students to the fundamentals of digital systems and computer hardware. It will include the following topics: Digital systems fundamentals; binary, octal and hexadecimal number systems; Boolean logic; AND, OR, NAND, NOR, EXOR gates; Computer architecture types RISC, CISC; CPU, memory systems, storage devices, input/output ports; assembly language programming.
Credit Points: 12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Explain the fundamentals of binary numbers and Boolean logic; 2. Explain the different components of a computer architecture and how they operate; 3. Develop basic assembly language programs.
Class Contact: Forty eight (48) hours for one semester comprising lectures and laboratories.
Required Reading: Tanenbaum, A. 2006 5th Ed. Structured Computer Organization Prentice Hall
Assessment: Assignment, Assignment-1 (4-5 technical questions), 20%. Assignment, Assignment-2 (4-5 technical questions), 20%. Test, Test-1, 20%. Test, Test-2, 40%.

ECB1121 PROGRAMMING PRINCIPLES

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit provides basic understanding of a modern object oriented language. The unit develops skills in software development, through an algorithmic approach and the application of principles of objected oriented programming. Content includes: introduction to programming; basic constructs of a programming language; sequence, selection and iteration; classes and objects, inheritance, use of predefined classes from libraries; one dimensional arrays; graphical user Interface.
Credit Points: 12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Discuss and apply fundamental aspects of computer program development; 2. Describe software development activities; 3. Develop algorithms using basic programming constructs; 4. Manipulate primitive data types and structured data types; 5. Apply basic object-oriented software principles in problem solving.
Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials and laboratories.
Required Reading: Lewis J., DePasquale P., & Chase J. (2011) Second Edition, Java Foundations: Introduction to program design and data structures, Pearson

International Edition.
Assessment: Assignment, Programming Assignment (300-500 lines of code), 25%. Laboratory Work, 5-6 Programming tasks, 25%. Test, Test-1, 20%. Test, Test-2, 30%.

ECB1131 COMPUTER NETWORK CONCEPTS

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit provides an introduction to data communication fundamentals, network transmission technologies and network protocols. It introduces students to basic design and communicational issues related to local area networks, wide area networks and the Internet. Content includes: History and fundamentals of data communications and networks; standards; communication media types; data communications principles and protocols; network architectures and protocols, standard interfaces and transmission techniques; data integrity and security; Local Area Networks (LAN); data link control; IP Addressing and Subnetworking; Routing protocols like RIP; Switching technologies and Virtual LANs; Design and implementation of enterprise networks using industry standard equipment like CISCO routers and switches.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an understanding of modern business and personal applications of data communication systems; 2. Apply various technologies to solving data communication and networking problems; 3. Design IP networks with proper subnetworks; 4. Design switching networks; 5. Implment moderately complex networks with industry standard technologies like CISCO routers and switches. (LiWC)
Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorial and practical sessions.
Required Reading: Kurose, J. F. , Ross, K. W. (2010) 5th Ed. Computer Networking Boston: Pearson Addison-Wesley Bennett, S. (2009) 2nd Ed. 31 Days Before Your CCNA Exam: A Day-by-Day Quick Reference Study Guide Indianapolis: Cisco Press
Assessment: Assignment, Practical Assignment-1: network design project 1 (individual assginment project), 20%. Laboratory Work, Practical Lab (4 to 7 networking labs involving Cisco routers and switches), 20%. Test, 2 hour Written Test, 35%. Assignment, Practical Assignment-2: network design project 2 (individual or group project), 25%. Assignment 2 is LiWC assessment in a simulated environment. Assignment 1 linked to Learning Outcome 3. Laboratory work linked to Learning Outcomes 1, 2, 3, 4. Assignment 2 linked to Learning Outcomes 5. Test linked to Learning Outcomes 1,2,3,4,5.

ECB1151 COMMUNICATION AND INFORMATION MANAGEMENT

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit aims to develop a set of skills associated with oral, written, technical and online communication. Students will be involved in locating and assembling reliable sources of information for collation and presentation. Information is stored and managed electronically for effective storage and communication. Content includes: overview of the Internet, characteristics and functions of browsers, web design and authoring, resources on the Internet, using search engines effectively, use of technology in information gathering, storage and reporting, formal and academic written communication, oral and online presentation.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Locate relevant Web-based and other resources; 2. Conduct basic research to gather information; 3. Assess reliability of resources; 4. Access and collate information from a variety of sources; 5. Apply a variety of approaches to present researched information; 6. Design and develop online material; 7. Develop communication and team work skills.
Class Contact: Forty-eight (48) hours for one semester comprising lectures, practical sessions, and group activities.
Required Reading: Felke-Morris, T. (2009) 5th Ed. Web Development and Design Foundations with XHTML Pearson Education
Assessment: Assignment, Web page design and development, 40%. Test, Test-1, 20%. Test, Test-2, 20%. Laboratory Work, 4-5 Practical tasks, 20%.

ECB1213 COMPUTER OPERATING SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit introduces students to modern computer operating systems, their major components and roles. Students will be exposed to at least two popular operating systems including a mobile OS. Content includes: Operating System (OS) concepts, OS architectures; threads and processes; concurrency, daemons and services; memory management, devices and device drivers; file systems, security; basic scripting.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an understanding of the basic OS architectures, functions and roles; 2. Cite the history and identify social impacts of different operating systems, including mobile OS; 3. Describe OS components for processes, devices, files and memory management; 4. Research and report information on operating system types; 5. Partake in peer assessment to evaluate critically written essays.
Class Contact: Forty-eight (48) hours for one semester comprising lectures, practical sessions, and tutorials.
Required Reading: McIver-McHoes A. & Flynn, I. (2008) 6th Ed. Understanding Operating Systems Cengage Learning
Assessment: Assignment, Assignment (2500-3000 words), 30%. Examination, Final 3 hours written examination, 70%.

ECB1222 WEB DESIGN AND PROGRAMMING

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit provides an introduction to coding Web sites using XHTML (Extensible Hyper Text Markup Language) and Cascading Style Sheets (CSS); client-side scripting is a form of programming used in conjunction with XHTML and CSS; design and implementation of client-side scripting. Contents include: XHTML; CSS; objects and methods; objects in the context of the document object model; cookies; embedding JavaScript within HTML documents; use of client-side programming and simple animation effects.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply Web design principles in the effective design of Web sites; 2. Design and develop Web sites using XHTML, CSS and JavaScript; 3. Design and program client-side scripts using JavaScript.
Class Contact: Forty eight (48) hours for one semester comprising lectures and laboratories.
Required Reading: Gosselin, D. (2011) 1st Ed. Principles of HTML, XHTML, and DHTML Course Technology
Assessment: Assignment, Assignment-1 (Web development), 20%. Assignment,

Assignment-2 (Web development), 20%. Examination, Final 3 hours written examination, 60%.

ECB1223 INTRODUCTION TO SYSTEMS ANALYSIS AND DATABASES

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit introduces fundamental concepts underpinning the analysis and design of information systems and explains the role and purpose of systems analysis. Students gain mastery of standard techniques to identify system requirements and design a simple database system. Content includes: systems concepts; role of the analyst; Systems Development Life Cycle (SDLC), process modelling, Entity-Relationship (ER) modelling; relational database design using ER and Extended ER modelling, relational algebra, SQL (Structured Query Language), normalisation; and database management systems (DBMS).

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1 Describe the benefits and functions of databases and their applications; 2 Design a database using key relational database model concepts; 3 Develop and apply ER and EER diagrams; 4 Illustrate a database and its relationships with a relational schema; 5 Implement a relational database with multiple tables using a relational DBMS; 6 Apply query languages and manage a database using SQL; 7 Normalise relations in a relational database system.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and practicals.

Required Reading: Elmasri, R. and Navathe, S. (2006) 5th Ed. Fundamentals of Database Systems Addison Wesley

Assessment: Assignment, Assignment (3-4 technical questions), 15%. Test, Test, 10%. Laboratory Work, 5-6 Practical tasks, and quizzes based on these tasks, 15%. Examination, Final 3 hours written examination, 60%.

ECB1252 INTRODUCTION TO THE COMPUTING PROFESSION

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit articulates the role and importance of the computing profession within the local and global communities. Content includes: the role of a computing professional; understanding how computers impact on society; ethical issues including: privacy and ownership, issues in storing and retrieving information, responsibilities to install, maintain and upgrade software; dealing with clients and problem solving; career options in IT; job application and interviews skills.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Identify the key roles of computing in the local and global communities; 2. Identify ethical issues in computing; 3. Communicate effectively by writing on a range of computer-related topics using appropriate language; 4. Communicate effectively using oral and visual presentations on range of computer-related topics; 5. Work individually and with others in teams; 6. Prepare Curriculum Vitae and demonstrate general job seeking skills; 7. Initiate an educational plan for learning and career goals.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, seminars and group activities.

Required Reading: Reading material will be negotiated in consultation with the lecturer and will be appropriate to the topic under investigation.

Assessment: Assignment, Assignment-1 (500-1000 words), 10%. Assignment, Assignment-2 (1000-1500 words), 20%. Presentation, Oral presentation-1 based on Assignment-1, 10%. Presentation, Oral presentation-2 based on Assignment-2, 20%. Portfolio, Initiate the creation of Web-based portfolio, 40%.

ECB2112 SECURITY, PRIVACY AND ETHICS

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit examines a wide range of ethical, privacy and security issues and concepts in the ICT field. The unit develops student critical thinking skills by introducing topical and controversial issues related to computing ethics, privacy and security problems. Content includes: information security concepts as applied to the management of information systems; different industry policies; mechanisms for implementing these policies; ethical implications of security, particularly with respect to privacy; Australian Computer Society (ACS) code of ethics; social issues of privacy, intellectual property, and the digital divide.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an understanding of the different principles underlying ethical decision making; 2. Critically discuss social and ethical issues in Information and Communication Technology (ICT) domains; 3. Identify and relate appropriate privacy measures and their management for computing environments; 4. Discuss electronic security concerns for the individual and for organisations; 5. Identify specific ethical, privacy and security issues in networked computing environments;

Class Contact: Forty-eight (48) hours for one semester comprising lectures, practical sessions, and group activities.

Required Reading: Quinn, M.J. (2009) 4th Ed. Ethics for the Information Age Pearson International

Assessment: Assignment, Assignment-1 (1000-1500 words), 20%. Assignment, Assignment-2 (1000-1500 words), 20%. Examination, Final 3 hours written examination, 60%. Assignment 1 assesses Graduate Capabilities L4, C4, W4, S4/Learning Outcomes 3 & 4. Assignment 2 assesses Graduate Capabilities P4, C4, W4, S4, CD4/Learning Outcomes 1, 2,4 and 5. Examination assesses Graduate Capabilities P4, L4, C4/Learning Outcomes 1 to 5.

ECB2123 PROGRAMMING FOR NETWORKS

Locations: Footscray Park.

Prerequisites:ECB1121 - PROGRAMMING PRINCIPLES

Description: This unit explores the methodologies and approaches used in programming for computer networks through using appropriate features and the application programming interface of a modern programming language. Content includes: In-depth study of classes and objects, polymorphism; advanced graphical user interfaces (GUI), programming for Transmission Control Protocol (TCP) and Universal Datagram Protocol (UDP); multithreading to support graphics and networking applications; file input and output; object streams and exception handling.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an understanding of networking with URLs (Uniform Resource Locators), sockets and datagrams; 2. Establish a simple server using TCP/IP protocol; 3. Implement a network client; 4. Create multithreaded programs that correctly execute with GUIs and/or networks; 5. Program basic client-server communications; 6. Demonstrate general network programming ability.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, practical sessions, and tutorials.

Required Reading: Deitel & Deitel (2010) 8th Ed. Java How to Program Pearson Education

Assessment: Assignment, Assignment-1 (Network programming tasks), 25%. Assignment, Assignment-2 (Network programming tasks), 25%. Examination, Final 3 hours written examination, 50%.

ECB2124 WEB-BASED SYSTEMS DEVELOPMENT

Locations: Footscray Park.

Prerequisites:ECB1222 - WEB DESIGN AND PROGRAMMING

Description: This unit prepares students for developing web-based applications that require content to be dynamically generated from a variety of data sources. Content includes: server-side scripting; dynamic generation of XHTML based on data retrieved from databases; web services; server and database system programming for dynamic web applications.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply object-oriented programming to plan and design web applications for real-world clients; 2. Integrate data sources with web applications; 3. Create and utilise web services; 4. Build a multi-tier web application.

Class Contact: Forty eight (48) hours for one semester comprising lectures and laboratories.

Required Reading: Mike Snell, Tony Northrup, Glenn Johnson (2009) Microsoft® .NET Framework 3.5 ASP.NET Application Development USA, Microsoft Press

Assessment: Assignment, Assignment-1 (Web systems development), 20%. Assignment, Assignment-2 (Web systems development), 20%. Examination, Final 3 hours written examination, 60%. Assignment 1 -20% of LiWC (plan and design web applications for real-world clients) Assignment 2 -20% of LiWC (Build a multi-tier web application and assessment via clients' feedback) Assignment 1 -Capabilities 1, 2,3, 4 and Learning Outcomes 1, 2, 3, 4 Assignment 1 -Capabilities 1, 2,3, 4 and Learning Outcomes 1, 2, 3, 4 Examination -Capabilities 1, 2,3,4 and Learning Outcomes 1, 2, 3, 4.

ECB2132 INTERNETWORKING TECHNOLOGIES

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit enhances and deepens the knowledge on internetworking technologies and protocols. Content includes: Routing algorithms and protocols including EIGRP and OSPF, Network Address Translation (NAT), IP V6, Wide Area Networks (WANs), Transmission Control Protocol, and network design and implementation with industry standard equipment like Cisco routers and switches.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Explain the mechanisms and algorithms of major switching and routing technologies; 2. Design networks with appropriate network structures, addresses and routing protocols; 3. Design and implement networks with industry standard technologies for LANs, WANs and the Internet (e.g. with Cisco Routers and WAN Switches).

Class Contact: Forty-eight (48) hours for one semester comprising lectures and laboratories.

Required Reading: Kurose, J. F. , Ross, K. W. (2010) 5th Ed. Computer Networking Pearson Addison-Wesley

Assessment: Assignment, Assignment (networking project and Report), 25%. Laboratory Work, Practical tasks (4 to 6 labs), 15%. Examination, Final 3 hours written examination, 60%. Assignment is LiWC assessment in a simulated environment. Laboratory work linked to Leanring Outcomes 1, 2, 3. Assignment linked to Learning Outcomes 1,2,3. Examination linked to Learning Outcomes 1,2,3.

ECB2225 MULTI-USER DATABASE SYSTEMS

Locations: Footscray Park.

Prerequisites:ECB1223 - INTRODUCTION TO SYSTEMS ANALYSIS AND DATABASES

Description: This unit provides students with an in-depth understanding of the design and implementation of modern multi-user database systems. Content includes: design and implementation of robust and scalable database applications; issues pertaining to multi-user database environments, such as transaction management and performance; in-depth study of Structured Query Language (SQL); database application development tools; database performance optimisation.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Explain design principles underlying multi-user database management systems;
- Apply database theories to real-life database applications;
- Demonstrate knowledge of the technologies that underpin multi-user database systems;
- Analyse a real-life problem, and design and implement a system using a commercial database management system;
- Evaluate the robustness and scalability of database systems.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and practicals.

Required Reading: Connolly, T.M., and Begg, C.E. (2010) 5th Ed. Database Systems: A Practical Approach to Design, Implementation and Management Pearson International

Assessment: Assignment, Assignment-1 (4-5 technical questions), 20%. Assignment, Assignment-2 (5-6 technical questions), 30%. Examination, Final 3 hours written examination, 50%.

ECB2234 NETWORK SECURITY

Locations: Footscray Park.

Prerequisites:ECB2132 - INTERNETWORKING TECHNOLOGIES

Description: This unit investigates processes of security at local and network levels, including security policies and practices, software, hardware and human issues. Content includes: physical and system security; cryptosystems; authentication and authorization; Access Control List (ACL); firewalls and port security; secure and insecure web protocols (e.g. telnet, ssh); secure email protocols (e.g. PGP and S/MIME); intrusion detection and system hardening; security in Virtual Private Networks (VPN), cloud computing, and databases.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Audit a system for security vulnerabilities; 2. Manage and use system security and logging tools; 3. Identify strengths and weaknesses in security products; 4. Apply security tools to strengthen a networked system; 5. Analyse a system for deploying the most appropriate security solution; 6. Design and implement a security solution given a set of constraints.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, practical sessions, and group activities.

Required Reading: Ross J. Anderson (2008) 2nd Ed. Security Engineering: A Guide to Building Dependable Distributed Systems Wiley

Assessment: Assignment, Assignment (1000-1500 words), 15%. Laboratory Work, 4-5 Practical tasks, and quizzes based on these tasks, 15%. Examination, Final 3 hours written examination, 70%.

ECB2241 WIRELESS NETWORKS

Locations: Footscray Park.

Prerequisites:ECB1131 - COMPUTER NETWORK CONCEPTS

Description: This unit provides students with an in-depth awareness of the fundamentals of Cisco WLAN and an overview of current technologies, together with an understanding of some scientific aspects of wireless communications and the necessary techniques to implement a WLAN. Content includes: wireless regulatory bodies; Wireless Local Area Networks (WLAN) fundamentals, such as Bluetooth, WiMAX, ZigBee; cordless phone technologies; wireless standards such as 802.11; authentication and encryption methods; wireless systems architectures, such as Cisco Unified Wireless Network Architecture.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an understanding of WLAN fundamentals; 2. Install and configure WLAN and clients; 3. Implement and design WLAN; 4. Conduct WLAN troubleshooting and maintenance.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and practicals.

Required Reading: Henry Chou and Michael Kang, 2010 CCNA Cisco Certified Network Associate Wireless study guide McGraw Hill

Assessment: Assignment, Assignment (Wireless LAN Deployment Project), 30%. Laboratory Work, Weekly Practical tasks, 20%. Examination, Final 2 hours written examination, 50%. Assignment - 30% LiWC (implmentation of WLAN according to clients' requirements) Assignment -Capabilities 1, 2,3, 4 and Learning Outcomes 1, 2, 3, 4 Laboratory Work -Capabilities 1, 2,3, 4 and Learning Outcomes 1, 2, 3, 4 Examination -Capabilities 1, 2,3,4 and Learning Outcomes 1, 2, 3, 4.

ECB2253 IT PROJECT MANAGEMENT

Locations: Footscray Park.

Prerequisites:ECB1121 - PROGRAMMING PRINCIPLESECB1252 - INTRODUCTION TO THE COMPUTING PROFESSION

Description: This unit investigates aspects of professional practice and specific tasks that need to be undertaken in order to initiate and implement an IT project. Content includes many aspects of Software Engineering, definition of a project; characteristics of IT projects; project life cycle; project team; project management aspects; scope, time, cost, quality, human resource; communications, risk, procurement, and integration management; project planning and scheduling; Critical Path Method (CPM); project execution and monitoring; project closure; project management software.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Define a project, and identify the special characteristics of IT projects; 2. Describe the key elements of a project plan, including cost and time schedules; 3. Prepare a software project management plan; 4. Perform the allocated role in the project team; 5. Execute an industry / community IT project.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and group activities.

Required Reading: Schwalbe, K. (2010) 6th Ed. Information Technology Project Management Thomson Course Technology

Assessment: Assignment, 2 Assignments including LiWC aspects (approx .1000 words each), 30%. Test, 2 Tests (10% each), 20%. Project, Group project documentation (2000-2500 words), 40%. Presentation, Oral presentation on project completion, 10%.

ECB3135 SERVER ADMINISTRATION AND MAINTENANCE

Locations: Footscray Park.

Prerequisites:ECB1232 - NETWORK COMMUNICATIONS AND ROUTING

Description: This unit provides students with the knowledge of server administration, including database and operating system administration. Content includes: database (DB) administration; operating system (OS) administration; system administration: network connection, data backup, software administration; TCP/IP (Transmission Control Protocol/Internet Protocol) configuration; creating DNS (Domain Name Servers), wireless communication systems administration; firewalls, IPSec protocols.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Explain fundamentals of database, operating systems, and server administration; 2. Develop server administration and maintenance skills; 3. Configure real-life network infrastructures, including wireless systems.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and practicals.

Required Reading: Burgess, Mark (2007) 2nd. ed. Principles of Network and System Administration Melbourne: John Wiley & Sons

Assessment: Assignment, 2 Reports (1000 words), 25%. Laboratory Work, 5-6 Practical tasks, and tests based on these tasks, 25%. Examination, Final 2 hour written examination, 50%. 2 Technical reports based on real industry problems and seminars given by industry professionals are the LiWC components, with a weighting of 25% of assessment.

ECB3142 ACTIVE DIRECTORY DESIGN AND MANAGEMENT

Locations: Footscray Park.

Prerequisites:ECB1232 - NETWORK COMMUNICATIONS AND ROUTING

Description: This unit provides students with knowledge and skills for Active Directory (AD) design, implementation and management. Content includes: Active Directory technology, Active Directory Infrastructure (ADI), Domain Name Systems (DNS), Active Directory Objects (ADO), Active Directory group policy, design and implementation of AD, management and administration of AD.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply core knowledge of Active Directory; 2. Plan and construct Active Directory Infrastructure; 3. Manage and maintain Active Directory Infrastructure; 4. Design and develop Domain Name Systems for Active Directory; 5. Create and manage Active Directory Objects; 6. Plan and develop Active Directory group policy; 7. Design, implement and manage proper Active Directory based on enterprise requirements (LiWC).

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and practicals.

Required Reading: Dennis Suhanovs (2008) MCTS Windows Server 2008 Active Directory Services Study Guide McGraw Hill

Assessment: Laboratory Work, Practical tasks (4 to 6 labs), 25%. Assignment, Design and implementation of active directories (individual or group design project)., 25%. Examination, Final 2 hours written examination, 50%. The assignment is assessed in a simulated environment (LiWC). Laboratory work linked to Learning Outcomes 1-7. Assignment linked to Learning Outcome 7. Examination linked to Learning Outcomes 1-7.

ECB3143 NETWORK MANAGEMENT

Locations: Footscray Park.

Prerequisites:ECB1232 - NETWORK COMMUNICATIONS AND ROUTING

Description: This unit examines principles and practice of network management, and introduces network management functions. Content includes: fault identification; configuration, accounting, performance and security management in networks; Simple Network Management Protocol (SNMP); network management tools and systems, such as CiscoWorks LAN Management Solution (LMS).

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Explain the principles of network management; 2. Develop the skills required to manage networks; 3. Perform network management tasks.

Required Reading: Alexander Clemm /(2006) Network Management Fundamentals Cisco Press

Assessment: Assignment, 2 Reports (4-5 technical questions), 25%. Laboratory Work, 10 Practical tasks, 25%. Examination, Final 2 hours written examination, 50%. Practical tasks based on real industry problems, feedback from industry professionals on completed assignments.

ECB3154 COMPUTING PROJECT ANALYSIS AND DESIGN

Locations: Footscray Park.

Prerequisites: First year of SBNS or equivalent plus six 2nd year units.

Description: This unit centres on an industry sponsored group project. In a team students develop an IT solution to solve a real-world problem for their client. Student activities include: business case analysis, requirements modelling, data and process modelling, and project management. This unit brings together the knowledge and skills acquired by students in earlier units and apply them to a real-world system development project.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Gain knowledge for working on a real-world software development project; 2. Apply software engineering and database design methodologies; 3. Demonstrate IT project management skills, such as liaising with clients, working in a team; 4. Create and produce project documentation;

Class Contact: Forty-eight (48) hours for one semester comprising group project work.

Required Reading: Reading material will be negotiated in consultation with the lecturer and will be appropriate to the topic under investigation.

Assessment: Presentation, Oral presentation-1 on project progress (5-10 minutes), 10%. Presentation, Oral presentation-2 on project update (5-10 minutes), 15%. Project, Group project documentation (4000-5000 Words), 75%. Oral presentations -25% LiWC (presentations of the progress of projects with clients' feedback and requirements) Project documents - 75% LiWC (working with client to create and produce analysis and design project documents) Oral presentations -Graduate Capabilities 1, 2,3, 4, 5, 6 and Learning Outcomes 1, 2, 3, 4 Project documents - Graduate Capabilities 1, 2,3,4, 5, 6 and Learning Outcomes 1, 2, 3, 4.

ECB3214 VIRTUALISATION IN COMPUTING

Locations: Footscray Park.

Prerequisites:ECB2132 - INTERNETWORKING TECHNOLOGIES

Description: This unit provides students with knowledge and skills of virtualisation in computing including design, implement and management of virtualisation. Content: fundamentals of virtualisation in computing, server virtualisation, storage virtualisation, desktop virtualisation, application virtualisation, design and develop virtualised environments, manage and administration of virtualised systems.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply core knowledge of virtualisation; 2. Manage a virtualisation environment with industry products; 3. Design and develop virtual machines with main-stream industry technologies (LiWC); 4. Design, develop and manage desktop virtualisation; 5. Design, develop and manage application virtualisation.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and practicals.

Required Reading: Jason Kappel, Anthony Velte, and Toby Velte (2009) Microsoft Virtualization with Hyper-V McGraw Hill

Assessment: Laboratory Work, Practical Labs (4 to 6 labs), 25%. Assignment, Design and implement virtualised environment ((individual or group design project), 25%. Examination, Final 2 hours written examination, 50%. Assignment is assessed in simulated environment (LiWC) Laboratory work (linked to Learning Outcomes 1,2,3,4,5) Assignment (linked to Learning Outcomes 1,2,3,4,5) Examination (linked to Learning Outcomes 1,2,3,4,5).

ECB3244 ADVANCED NETWORK TECHNOLOGIES

Locations: Footscray Park.

Prerequisites:ECB2234 - NETWORK SECURITYECB2241 - WIRELESS NETWORKSEither/ Or

Description: This unit will introduce students to the latest networking technologies and their ability to handle advanced communications applications. Students will work with an industry or community organisation to design an advanced network for their current and/or future networking and data communication needs. Content includes: advanced networking technologies, such as Ad-hoc Networks, ubiquitous networks, and sensor networks; an industry standard framework for network design and evaluation.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe important features of advanced networking technologies; 2. Assess the networking needs of an industry or community organisation; 3. Apply network design principles to develop a model of the required network; 4. Evaluate a number of network technologies to meet the design requirements; 5. Design a network to meet the organisation needs; 6. Apply good design and project management principles.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and industry design project.

Required Reading: Peter Rybaczyk (2004) Cisco Network Design Solutions for Small-Medium Businesses CISCO Press

Assessment: Test, 2 Tests, 10% each, 20%. Project, Group project design and documentation (2000-3000 words), 30%. Presentation, Group project oral presentation, 20%. Examination, Final 2 hours written examination, 30%.

ECB3255 SMALL IT BUSINESS DEVELOPMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit will prepare students for starting and running a small IT business. It will enable students to research and develop a new IT business proposal. Contents include: forms of business ownership: sole proprietorship, partnership, corporation and trusts; types of IT-related businesses; business plan development; business functions: marketing, location, operations, staffing, accounting; government assistance; e-business; home-based business; taxation; borrowing; franchising; social, environmental and ethical considerations.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Distinguish the various forms of ownership of small businesses, including IT businesses; 2. Evaluate various IT business opportunities; 3. Prepare a proposal for starting and running a business; 4. Appraise sources of finance for starting and running the business.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials, and group activities.

Required Reading: Hatten, T. S (2012) 5th Edition Small Business Management: Entrepreneurship and Beyond Sydney: Cengage Learning

Assessment: Assessments 'Project' and 'Presentation' are part of the same assessment task. Assignment, Assignment (1000 words per person), 20%. Test, 2 Tests, 15% each, 30%. Project, Team project documentation (1500 words per person), 35%. Presentation, Oral presentation on team project (20 minutes), 15%. Assignment assesses : Learning Outcomes 1 & 2 Graduate Capabilities 3, 4 & 5 Test assesses: Learning Outcomes 1,2,3 & 4 Graduate Capabilities 2, 3 & 4 Team Project assesses: Learning Outcomes 2, 3, & 4 Graduate Capabilities 1, 2, 3, 4, 5, & 6 Oral Presentation assesses: Learning Outcomes 2, 3 & 4 Graduate Capabilities 3, 4 & 5 Project and Presentation are linked to LiWC. .

ECB3256 COMPUTING PROJECT DEVELOPMENT AND IMPLEMENTATION

Locations: Footscray Park.

Prerequisites:ECB3154 - COMPUTING PROJECT ANALYSIS AND DESIGN

Description: This unit centres on an industry sponsored group project. In a team students continue developing the IT project initiated in ECB3154. Student activities include: develop project strategies with an increased focus on object modelling and project management for producing stipulated deliverables. Students also gain knowledge of quality assurance techniques, systems implementation strategies, and testing methodologies. Students are required to submit a final project report and demonstrate working software system.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Gain practical skills in quality assurance, systems implementation and testing; 2. Apply software engineering and database methodologies; 3. Extend their oral and written communication skills; 4. Extend their team working and project management skills.

Class Contact: Forty-eight (48) hours for one semester comprising group project work.

Required Reading: Reading material will be negotiated in consultation with the lecturer and will be appropriate to the topic under investigation.

Assessment: Presentation, Oral presentation-1 on project continuity (5-10 minutes), 10%. Presentation, Oral presentation-2 on project completion (5-10 minutes), 15%. Project, Group project documentation (4000-5000 Words), 75%. Oral presentations -25% LiWC (presentations of systems development and implementation with clients' feedback and inputs) Project documents - 75% LiWC (working with client to produce systems implementation and testing documents) Oral presentations -Graduate Capabilities 1, 2,3, 4, 5, 6 and Learning Outcomes 1, 2, 3, 4 Project documents - Graducate Capabilities 1, 2,3,4, 5, 6 and Learning Outcomes 1, 2, 3, 4.

ECS4100 ANALOG AND DIGITAL TRANSMISSION

Locations: Footscray Park.

Prerequisites:ENE3101 - SYSTEMS ENGINEERINGComplete Second Year.

Description: The unit is designed to provide the theoretical basis for the understanding of the engineering aspects of the design, construction, and operation of the existing and emerging telecommunication systems. It also provides the support for students requiring basic knowledge of telecommunication engineering in order to handle concurrently studied Engineering Design projects that involve various aspects of telecommunication engineering. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent PBL exercises. In addition to delivery by lecture and tutorial, the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Explain signals and their characteristics as depicted in time and frequency domains; Discuss the information bearing nature of signals and the bandwidth considerations; Explain the principles behind frequency translation and its depiction as various types of modulation; Explain the signal transition in linear and non-linear systems, and the recognition of such systems in terms of filters and other components; Describe the types of noise present in telecommunication systems and the characterization of thermal noise; Perform the statistical analysis of random signals and the characterization of such signals in terms of correlation and power spectral density functions; Explain the concept of signal to noise ratio and its influence in faithful reception of analog and digital signals; Outline the assessment of performance in digital communication systems in terms of bit error probability; Describe the bandpass transmission techniques and application of line coding ; Discuss the baseband recovery of bandpass communication systems, including matched-filters, and the impact of the type of modulation in such systems. Understand the applications of probability theory in the analysis of engineering systems. Describe the space and material media that are capable of carrying signals used in Telecommunication systems; Describe the physical composition of such media, their characteristics and modes of operation; Discuss the limitations of such media with regard to frequency, bandwidth, and power; Explain the phenomena of propagation of electromagnetic waves in space and material media including coaxial cables and waveguides; Discuss the theoretical basis for electromagnetic wave propagation including Maxwell s equations; Explain line impedance, transmission, reflection, matching and there application to the design of high frequency circuits and systems. If time permits, introduce the Smith Chart; Explain free space propagation and practical propagation models. Explain the principles of digital communication systems and components. The Learning Outcomes of this unit of study will also depend upon the material presented, as required to support the concurrent Engineering Design exercises.

Class Contact: Sixty (60) hours or equivalent for one semester comprising of a mix of small group work, lectures, and workshops.

Required Reading: Lathi, B. P. (2001) 3rd ed. Modern digital and analog communication systems Oxford University Press Proakis, J. G., & Salehi, M. (2002) Contemporary communication systems using MATLAB Belmont, CA: Thomson Brooks/Cole Cheng, D. K. (1999) 2nd ed. Field and wave electromagnetics Addison Wesley

Assessment: Laboratory Work, Continuous assessment in laboratory work, 20%. Test, Mid-semester written test, 20%. Examination, End-of-semester examination, 60%.

ECS4200 SIGNAL PROCESSING AND DIGITAL MODULATION

Locations: Footscray Park.

Prerequisites:ENE3101 - SYSTEMS ENGINEERINGComplete Second Year.

Description: Introduction Continuous-time and discrete-time signals. The sampling theorem. Impulse sampling and the zero-order hold. The z-transform. Analysis of discrete-time systems Unit-pulse response. Causal linear shift-invariant systems. Ordinary convolution. Bounded-input bounded output stability. Difference equation and transfer pulse transfer function. Unit-delay operator and realization structures of causal linear shift-invariant systems. A stability test. The frequency response function The discrete-time Fourier transform (DTFT) pairs. Mapping between the s-plane and the z-plane. Infinite duration Impulse Response filters Butterworth and Chebyshev filters. Frequency scaling and transformations. Transformation of analog filters into IIR filters. Matched z-transform, impulse-invariance, and bilinear transformations. Finite duration Impulse Response filters Linear phase response. Filter design with window functions. Frequency sampling filters. The Discrete Fourier transform (DFT). Relationship between DFT and DTFT. The Fast Fourier transform (FFT). Computation of frequency spectra, zero padding. Cyclic convolutions and its application in filter realization. Application of digital signal processing to the modulation and demodulation of digital signals. Nyquist filtering, Binary Phase-Shift Keying, Quadrature Phase-Shift Keying and Quadrature Amplitude Modulation. Spectral efficiency of various modulation schemes. Channel coding and decoding; linear block code, cyclic code and convolution code. Coded modulation systems. Information theory and Source coding.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Perform time and frequency domain analysis of discrete-time linear signal processing systems; Design simple FIR and IIR filters; Perform spectral analysis on sampled signals with DFT via FFT. digital signals; Explain the principles of digital communication systems and components; Describe the optimum signal detection using matched filter receiver in additive white Gaussian noise; Explain the baseband transmission techniques; Discuss the effects of bandwidth limitation, intersymbol interference, Nyquist signalling and channel equalization; Describe the bandpass transmission techniques; Describe the BPSK, QPSK, and QAM modulation systems and coherent detection of those systems; Explain the carrier and clock synchronization techniques; Explain the channel coding including linear block codes, convolutional codes, and the Viterbi algorithm; Explain information theory, source coding, and data compression; Explain coded modulation systems, trellis coding, and decoding. The Learning Outcomes of this unit of study will also depend upon the material presented, as required to support the concurrent Engineering Design exercises.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and laboratories.

Required Reading:E.C. Ifeachor and B.W. Jervis, 2002 Digital Signal Processing - A Practical Approach Prentice Hall Kurzweil, J., 2000 An introduction to digital communications John Wiley Proakis, J. G., & Salehi, M., 2002 Contemporary communication systems using MATLAB Belmont, CA: Thomson Brooks/Cole

Assessment: Laboratory Work, Continuous assessment in laboratory work, 20%. Test, Mid-semester test, 20%. Examination, End-of-semester examination, 60%.

EES4100 OPERATING SYSTEMS AND NETWORK PROGRAMMING

Locations: Footscray Park.

Prerequisites:ENE3102 - SYSTEMS & APPLICATIONSENE3202 - EMBEDDED AND NETWORKED SYSTEMS

Description: This unit of study is designed to provide students with a good understanding of computer networking protocols, the management of computer networks, computer Operating Systems (OS) and the facilities within an OS that support network operations. This unit will cover: Topics include:- network models: OSI, TCP/IP; Network Layer – IP addressing, subnetting, netmask, IP protocols, ARP, ICMP, IP routing; Transport Layer – TCP, UDP protocols, flow control, error control, BSD sockets; Application Layer: DNS, HTTP. Operating systems topics include:- Process: thread, process synchronisation, semaphore, thread library, consumer-producer problem, dead locks, resource allocation, scheduling. Files systems : directory structures, access control, implementation. Memory Management : memory allocation, protection, virtual memory. Grid Computing : principles and applications.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe the principle and practice of computer networking protocols; 2. Design, configure and manage a computer network; 3. Describe the structure and operations of a modern computer system; 4. Create application programs that access the OS facilities by means of a high level language (C/C++, etc); 5. Create multithreaded application programs for a modern OS (Unix, etc); 6. Describe the principle of operation, typical application areas, advantages and limitations of a GRID computing environment.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and group practical activities.

Required Reading: Tanenbaum, A., 2003 4th Edition Computer Networks Prentice Hall Silberschatz. A., 2005 7th Edition Operating Concepts Wiley

Assessment: Test, Mid-semester test, 20%. Assignment, Semester assignment, 20%. Examination, Final examination, 60%.

EES4200 REAL TIME ASIC BASED SYSTEMS

Locations: Footscray Park.

Prerequisites:ENE3102 - SYSTEMS & APPLICATIONSENE3202 - EMBEDDED AND NETWORKED SYSTEMS

Description: This unit of study integrates the hardware and software knowledge from earlier years of study into the production of Application Specific Integrated Circuits (ASICs). The aim of the unit is for the students to learn how to bring together one (or more) microprocessors, memory blocks (containing a C++ real time program), I/O blocks and the student designed special purpose devices onto a single VLSI device. Managing the design of complex systems and the commercial considerations in using Intellectual Propriety (IP) soft-core building blocks. The use of a Real Time Operating System (RTOS) for task management including task scheduling, inter-task communication and performance profiling.

Credit Points:12

Learning Outcomes: On successful completion of this unit students are expected to be able to: 1. Design and implement a single chip digital system (FPGA) containing single or multiple customized soft-core microprocessors; 2. Use VHDL or symbolic library components to create customized hardware single chip designs; 3. Create embedded software for single chip systems using high level programming (C) and operating under the control of an RTOS; 4. Describe the problems associated with creating designs that include over 1 million logic gate equivalents; 5. Describe the process for and the commercial implications of employing soft-core IP modules and RTOS kernels in manufactured devices.

Class Contact: Sixty (60) hours or equivalent for one semester comprising of lectures, tutorials and group practical activities.

Required Reading: Labrosse, J. J., 2002 2nd edition MicroC/OS II The Real Time Kernel CMP

Assessment: Test, Mid-semester test, 20%. Assignment, Semester assignment, 20%. Examination, Final examination, 60%.

EMS4100 IC DESIGN AND EDA TOOLS

Locations: Footscray Park.

Prerequisites: Nil.

Description: The design of basic CMOS integrated circuits is covered, including overview of MOS technology, complex complementary CMOS design, combinational design techniques including dynamic and domino logic. Students will develop hands-on experience in design, simulation, verification and implementation using industry standard EDA tools for custom and semi-custom nanoelectronic design. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Have gained knowledge of basic custom and semi-custom integrated circuits design; 2. Have gained knowledge of custom and semi-custom integrated circuit design flow and circuit design; 3. Carried out significant tasks designed to improve desired generic skills and attributes; 4. Have gained knowledge of industry standard electronic design automation tools; 5. Have gained knowledge of electronic design automation tools for custom and semi-custom IC designs.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials, laboratory work, and project work.

Required Reading: Rabaey, J. M., 2002 2nd Edition Digital Integrated Circuits Prentice Hall

Assessment: Laboratory Work, Laboratory based excercises, 30%. Project, Industry based project, 30%. Examination, End-of-semester examination, 40%.

EMS4200 ANALOG AND MIXED SIGNAL DESIGN

Locations: Footscray Park.

Prerequisites:EMS4100 - IC DESIGN AND EDA TOOLS

Description: The design of CMOS analog and mixed-signal integrated circuits is covered. Design concepts of high speed low power amplifiers, filters, sample and hold circuits, comparators, digital to analog and analog to digital converters are fully analysed. Students will develop hands-on experience in design, simulation, verification and implementation using industry standard EDA tools.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe most common integrated circuit design, and D/A and D/A converters; 2. Use industry standard Software design tools.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials, laboratory work, and project work.

Required Reading: Behzad Razavi, 2001 Design of analog CMOS integrated circuits McGraw Hill International Edition

Assessment: Laboratory Work, Laboratory based excercises, 20%. Project, Industry based project, 20%. Examination, End-of-semester examination, 60%.

ENE2100 ENGINEERING DESIGN AND PRACTICE 2A

Locations: Footscray Park.

Prerequisites: Nil.

Description: This is a practical, PBL mode subject in which students work in teams to solve a number of problems specifically designed to integrate with the learning and content from ENE2101 and ENE2102. Teams of students will have an Electrical Engineering staff member as a 'coach or mentor' whilst working on these problems. 'Specialist' staff from the ENE2101 and ENE2102 subjects will be available to assist students with technical aspects of the problems. Staff members from the College of Arts will be available on a weekly basis to assist with the development of communications skills. Staff members from other Colleges will be available to provide workshops to assist students with the development of generic skills.

Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply knowledge of basic science and engineering fundamentals; 2. Communicate effectively, not only with engineers but also with the community at large; 3. Demonstrate technical competence in at least one engineering discipline; 4. Undertake problem identification, formulation and solution; 5. Utilise a systems approach to design and operational performance; 6. Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member; 7. Describe the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development; 8. Define the principles of sustainable design and development; 9. Define professional and ethical responsibilities and display a commitment to them; 10. Display the capacity to undertake lifelong learning; 11. Locate, evaluate, manage and use information effectively.

Class Contact: One hundred and twenty (120) hours for one semester comprising lectures and tutorials.

Required Reading: Nil

Assessment: Other, Attendance and participation, 10%. Project, Project demonstrations, 10%. Presentation, Oral presentations, 10%. Assignment, Written technical paper, 10%. Report, Written project report, 10%. Portfolio, Demonstrate the attainment of learning outcomes, 50%. In the portfolio students are required to demonstrate the attainment of learning outcomes using: peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports.

ENE2101 FUNDAMENTALS OF ELECTRICAL & ELECTRONIC CIRCUITS

Locations: Footscray Park.

Prerequisites:ENF1202 - ENGINEERING PHYSICS 2

Description: Independent sources, real voltage sources. Nodal Voltage Method. Supernodes. Dependent sources. Introduction to Operational Amplifiers, Inverting Amplifier, Non-inverting amplifiers, Comparator, Buffer and Summing Amplifier circuits. Real Resistors. Nominal values, tolerance, power rating and temperature coefficient. Volt-ampere characteristics. Equivalence. Thevenin's Theorem & Equivalent Circuit. Norton's theorem & Equivalent Circuit. Diode VI characteristics, Rectifier diodes and their application. Zener diodes. Capacitance. Parallel plate capacitor. Stray capacitance. Permittivity. Step response of RC circuit. Capacitor discharge. Time constant of RC circuit. Time delay and voltage ramp circuits. Electrostatic fields and energy storage in a capacitor. Ideal transformer. TRU circuits. Capacitors in power supplies. Real capacitors, electrolytic & non-electrolytic. Voltage regulators. Principle of Superposition. Non-ideal DC characteristics of real operational amplifiers. Introduction to AC circuits. Sinusoids. AC voltage applied to ideal resistor, and to ideal capacitor. Ractance. Phasors. AC voltage applied to RC series circuit. AC power in a resistor. RMS value. Crest and form factors. True RMS meters. Introductory description of mains electricity. Electric shock and safety. Introduction to magnetism. Induced voltage. Faraday's Law. Coils and self-inductance. Lenz's Law. Energy stored in a magnetic Field. Inductors in DC circuits. Switching induction circuits. LR series circuits and transient behvaiour. AC voltage applied to ideal self-inductor. Inductive reactance. RL series AC circuit. J operator. Revision of complex numbers. Use of complex numbers in AC circuit analysis. Complex impedance. Series RLC circuits. ESR and ESL of real capacitors. Resonance in series RLC circuits. Voltage multiplication. Parallel AC circuits. Parallel to seies and Series to parallel conversions. Admittance and susceptance. Input impedance of an amplifier. Resonance in parallel circuits.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Analyse simple DC and AC circuits using the methods outlined above; 2. Incorporate the presented material into subsequent design exercises; 3. Successfully study subsequent downstream Units of Study.

Class Contact: Sixty (60) hours or equivalent for one semester comprising of lectures and tutorials.

Required Reading: Provided Lecture Notes.

Assessment: Test, Mid-semester test, 20%. Examination, End-of-semester examination, 80%.

ENE2102 DIGITAL & COMPUTER SYSTEMS

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit introduces students to electronics circuits and engineering computer programming using a high level language(C/C++). An overview of a typical computer system. The program creation process (for an embedded microcontroller); editing, compiling and debugging. Data types, correct choice of type and their range. The use of variable, assignment, arithmetic and logical operations. Flow control using loops; if, while and switch statements. An Introduction to arrays. System library and user defined functions, function calls and parameters passing. An introduction to data structures and uses. Use of microcontroller PORTS for simple sensor/actuator interfacing. Logic gates, truth tables and Boolean algebra. Equation formation in Sum of Products and Product of Sums forms. Graphical methods of equation minimization including Venn diagrams and the Karnaugh map. Circuit implementation using universal gate sets. Combinational equation implementation using simple Programmable Logic Devices (PLDs). Latches and flip-flops, types, triggering, synchronous and asynchronous signals. Asynchronous counter design using flip-flop chains and manufacturer's devices. Simple multi-mode synchronous counter and state machine design. Electrical characteristics of logic devices.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Construct truth tables, formulate logic expressions, minimize logic expressions using Boolean Algebra and Karnaugh maps; 2. Design and construct simple combinational logic circuits in Sum of Products (SOP) and Product of Sums (POS) forms using simple gates and through VHDL and PLDs; 3. Design and construct sequential logic digital circuits using D and J-K flip-flops and logic gates; 4. Design simple sequential circuits through the use of state diagrams and implement on PLDs using VHDL; 5. Convert numbers between bases (decimal, binary and hexadecimal forms), perform binary and hexadecimal arithmetic and determine the permissible range of a number (signed and unsigned) given a word length; 6. Write programs in the C language to solve simple problems that may include use of selection and repetition structures, create arrays, store and manipulate data, employ library and user created function calls, pointers and simple data structures,etc; 7. Embed C programs onto a microcontroller and make appropriate use of input/output ports, interrupts, timers and external interface devices including simple sensors and displays.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and group laboratory practical activities.

Required Reading: Tocci, R., Widmer, N. and Moss, G., 2007 Digital Sytems: Principles and Applications Pearson/Prentice-Hall

Assessment: Test, Mid-semester test, 20%. Assignment, Semester assignment, 20%. Examination, End-of-semester examination, 60%.

ENE2200 ENGINEERING DESIGN AND PRACTICE 2B

Locations: Footscray Park.

Prerequisites: ENE2100 - ENGINEERING DESIGN AND PRACTICE 2A

Description: This is a practical, PBL mode subject in which students work in teams to solve a number of problems specifically designed to integrate with the learning and content from ENE2201 and ENE2202. Teams of students will have an Electrical Engineering staff member as a 'coach or mentor' whilst working on these problems. 'Specialist' staff from the ENE2201 and ENE2202 subjects will be available to assist students with technical aspects of the problems. Staff members from the College of Arts will be available on a weekly basis to assist with the development of communications skills. Staff members from other Colleges will be available to provide workshops to assist students with the development of generic skills.

Credit Points: 24

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply knowledge of basic science and engineering fundamentals. 2. Communicate effectively, not only with engineers but also with the community at large. 3. Apply In-depth technical competence in at least one engineering discipline. 4. Undertake problem identification, formulation and solution. 5. Utilise a systems approach to design and operational performance. 6. Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member. 7. Define the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development. 8. Describe the principles of sustainable design and development. 9. Define the professional and ethical responsibilities and display a commitment to them. 10. Display the capacity to undertake lifelong learning. 11. Ability to locate, evaluate, manage and use information effectively.

Class Contact: One hundred and twenty (120) hours for one semester comprising lectures and tutorials.

Required Reading: Nil.

Assessment: Other, Attendance and participation, 10%. Project, Project demonstrations, 10%. Presentation, Oral presentations, 10%. Assignment, Written technical paper, 10%. Report, Written report, 10%. Portfolio, Demonstrate the attainment of learning outcomes , 50%. In the portfolio students are required to demonstrate the attainment of learning outcomes using:- peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports.

ENE2201 LINEAR SYSTEMS WITH MATLAB APPLICATIONS

Locations: Footscray Park.

Prerequisites: ENF1201 - ENGINEERING MATHEMATICS 2ENE2101 - FUNDAMENTALS OF ELECTRICAL & ELECTRONIC CIRCUITS

Description: Analysis of linear time-invariant systems in time-domain. Lumped models of linear time-invariant system elements. Formulation of system equations and initial conditions for systems described by first-order and second-order linear constant-coefficients ordinary differential equations. Zero-input response and zero-state response. Unit-impulse function. Sifting property. Unit-step function. Laplace transformation and solution of ordinary linear differential equations with constant coefficients. Obtaining zero-input response and zero-state response for first-order and second-order systems by using Laplace transforms. Relationship between impulse response and transfer function. Poles and zeros and their significance. Transient response and steady-state response decomposition. Elementary eigenvalue-eigenvector problems and solution of a set of ordinary linear first-order differential equations with constant coefficients. Analysis of linear time-invariant systems in frequency-domain. Introduction to Fourier series and Fourier transforms. Frequency

response and Bode diagrams.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Perform time-domain analysis of linear time-invariant systems using Laplace transforms; 2. Perform frequency-domain analysis of linear time-invariant systems using Fourier series and Fourier transforms; 3. Apply linear algebra to find trajectories of linear systems modelled as a system of first-order linear ordinary differential equations with constant coefficients; 4. Employ simple MatLab commands and Simulink to analyse linear time-invariant systems.
Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and laboratory work.
Required Reading: Alexander, C.K. and M.N.O. Sadiku, 2004 Fundamental of Electric Circuits McGraw-Hill Strum, R.D. and D.E. Kirk, 2000 Contemporary Linear Systems using MatLab Brooks/Cole Kreyszig, E., 2006 Advanced Engineering Mathematics John Wiley
Assessment: Test, Semester tests, 20%. Report, Laboratory report, 20%. Examination, End-of-semester examination, 60%.

ENE2202 ELECTRONIC SYSTEMS

Locations: Footscray Park.
Prerequisites:ENE2101 - FUNDAMENTALS OF ELECTRICAL & ELECTRONIC CIRCUITSENE2102 - DIGITAL & COMPUTER SYSTEMS
Description: Internal architecture of a small embedded microcontroller. An overview of instruction set and Assembler Language. Use of microcontroller on-chip peripherals and features including:- timer/counters, interrupts, Analog to Digital converters. Interfacing to LCDs and digital displays. Logic data path element description (counters, registers, multiplexers, encoders, decoders, comparators etc) using VHDL and implementation on PLDs. PLD architectures. Applications of datapath elements. PN diodes, electrical characteristics, applications. Zener diodes. Bipolar transistors, characteristics, small signal model analysis and design. MOSFET devices, characteristics, configurations and use in amplifier design. Voltage regulators, series and shunt types.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe applications of common digtal datapath elements; 2. Describe the structure, benefits and limitations of simple and complex PLDs; 3. Design interconnected logic circuits comprising several datapath elements all described in VHDL and implemented on PLDs; 4. Describe the internal architecture of a simple embedded microcontroller and create and analyse simple Assembler Language programs; 5. Write C programs that respond to external and internal interrupts and maintain a simple "real-time" flow and interface to common display devices including 7-sement displays and LCDs; 6. Describe the characteristics of semiconductor devices (Diodes, Bipolar and Metal Oxide Transistors); 7. Analyse and design of simple rectifier based power supplies and small signal amplifiers.
Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and group laboratory practical activities.
Required Reading: Roth, C.H., 2004 5th edition Fundamentals of Logic Design Thomson Learning Sedra, A. and Smith, K, 2004 5th edition Microelectronic Circuits Oxford University Press
Assessment: Test, Mid-semester tests, 20%. Assignment, Semester assignments, 20%. Examination, End-of-semester examination , 60%.

ENE2203 INDUSTRIAL CONTROL AND AUTOMATION

Locations: Footscray Park.
Prerequisites:ENE2102 - DIGITAL & COMPUTER SYSTEMS
Description: Programmable Logic Controllers: Introduction to PLCs, programming and application. Introduction to Digital Control: Control loops, Process responses, PID algorithm. Loop tuning. Sensors and Actuators: Resistive, inductive, capacitive, photo-electric, Stepping Motors, Solenoids and applications. Analog to Digital Conversion, Digital to Analog Conversion and Signal Conditioning Circuits. SCADA : Concepts, Human Interface, Remote Terminal Unit, Master Station, Communication Infrastructure, Controller Area Network, Machine to machine communication, Security. System Design and Implementation. Electronics Manufacturing: PCB Design, Routing, Components Placement, Signal Integrity, Electromagnetic Compatibility, Design for Manufacturing, Schematic and Netlist, Library, Components and Data Sheets.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Program PLC; 2. Apply PID algorithm to effectively control a system; 3. Use appropriate sensors and actuators in an engineering setting: 4. Use A-to-D and D-to-A for interfacing; 5. Explain SCADA systems and its components as well as being able to design a SCADA system for a simple manufacturing plant; 6. Explain the whole electronics manufacturing process in general and PCB design and production in particular; 7. Design a PCB for a given electronic circuit that could be produced in volume by outsourcing to other companies.
Class Contact: Sixty (60) hours for one semester comprising lectures/tutorials and laboratory sessions.
Required Reading: Ng, Y., 2008 Class notes (Rev. ed.) Footscray, Australia: Victoria University, School of Electrical Engineering
Assessment: Assignment, Laboratory assignments, 30%. Test, Tests throughout semester, 10%. Examination, End-of-semester examination, 60%.

ENE3100 ENGINEERING DESIGN AND PRACTICE 3A

Locations: Footscray Park.
Prerequisites:ENE2200 - ENGINEERING DESIGN AND PRACTICE 2B
Description: This unit is designed to create the opportunity for students to integrate generic skills with the learning and content from the concurrent third year subjects. The PBL approach to this unit of study requires students to form a holistic consideration of problems which are not only technical in nature but also exercise the students generic skills. Students are required to demonstrate critical thinking, problem solving skills, systems thinking and professional engineering practice. The unit is delivered in PBL mode and will encourage students to become independent learners and self reflective about professional communication processes and practices.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply knowledge of basic science and engineering fundamentals;
- Communicate effectively, not only with engineers but also with the community at large;
- Apply in-depth technical competence in at least one engineering discipline;
- Undertake problem identification, formulation and solution;
- Utilise a systems approach to design and operational performance;

- Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
- Define the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development;
- Describe the principles of sustainable design and development;
- Define the professional and ethical responsibilities and display a commitment to them;
- Display a capacity to undertake lifelong learning;
- Locate, evaluate, manage and use information effectively.

Class Contact: One hundred and twenty (120) hours for one semester comprising lectures, tutorials and group work.
Required Reading: Given the diverse nature of the Unit there is no set textbook for this module. However, study material will be handed out during the course of the Unit and this will be considered as essential reading.
Assessment: Other, Workshop attendance and participation, 10%. Presentation, Oral presentation, 10%. Presentation, Semester and final team product demonstration, 30%. Report, Written technical report, 30%. Portfolio, Reflective Journal Portfolio, 20%. In the portfolio students are required to demonstrate the attainment of learning outcomes using: peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports. .

ENE3101 SYSTEMS ENGINEERING

Locations: Footscray Park.
Prerequisites:ENE2201 - LINEAR SYSTEMS WITH MATLAB APPLICATIONS
Description: Probability theory. Continuous random variables and probability density functions. Normal distribution. Expected value, mean and variance. Joint and marginal distributions. Baye's theorem, conditional distribution. Functions of random variables. Conditional expectation and maximum likelihood estimation. Confidence intervals and hypothesis testing. Introduction to random processes, Gaussian processes. Correlation, covariance, and power spectrum. Examples of communication systems, cellular telephony systems and Internet. Communication signal analysis using Fourier series and Fourier transforms. Convolution. Spectral standards and bandwidth calculations. Waveform distortion. Nyquist sampling theorem. Implication of Shannon's theorem. Pulse Code Modulation (PCM) as an analog to digital converter. Line codes in baseband communication systems. Thermal noise and their effects in communication systems. Feedback problems and their solutions. Low sensitivity design. Dynamic characteristics and closed-loop stability, algebraic stability tests. Introduction to PID controllers.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: Understand the applications of probability theory in the analysis of engineering systems; Explain the principles of digital communication systems and the implication of Shannon's theorem in information theory; Perform spectral calculations for line codes employed in baseband communication systems; Compute signal to quantization noise ratio in PCM systems; Perform stability analysis on control systems; State and differentiate the purposes and requirements of communication systems and control systems; Perform elementary time-domain and frequency-domain analyses of simple communication systems and control systems; Employ simple MatLab commands and Simulink to analyse simple communication systems and control systems. The Learning Outcomes of this unit of study will also depend upon the material presented, as required to support the concurrent Engineering Design exercises.
Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and laboratory work.
Required Reading: Lathi, B.P., 1998 Modern Digital and Analog Communication Systems Oxford University Press Proakis, J. G., & Salehi, M., 2002 Contemporary communication systems using MATLAB Belmont, CA: Thomson Brooks/Cole Nise, N.S., 2003 Control Systems Engineering John Wiley
Assessment: Laboratory Work, Continuous assessment in laboratory work, 20%. Test, Mid-semester written test, 20%. Examination, End-of-semester examination, 60%.

ENE3102 SYSTEMS & APPLICATIONS

Locations: Footscray Park.
Prerequisites:ENE2202 - ELECTRONIC SYSTEMS
Description: Synchronous system design; Moore and Mealy models. Description in VHDL. An introduction to Algorithmic State Machine Design through VHDL description and PLD implementation. Controller and data-processor partitioning. Mechanical and Electromagnetic Fundamentals: Magnetic field, Faraday's Law and Lenz's Law. DC shunt motors Frequency response of amplifiers; an introduction to wide-band and high frequency amplifier design. Differential amplifiers, models of operation, gain, CMMR; design for performance characteristic. Feedback: Classification and the effect on driving point impedance and transfer functions. Series and Shunt feedback, Stability and gain and phase margins and compensation. Introduction to Switch mode power supply.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Implement optimal state machines for a range of electronic engineering applications; 2. Apply a system level approach to digital design using the algorithmic state-machine design paradigm; 3. Synthesize ASM controllers using: the traditional method, ROM based method and one-hot method; 4. Describe the fundamental principles of mechanical and electromagnetic energy conversion; 5. Analyse simple power systems containing DC machines and transformers; 6. Analyse a range of analogue circuit types and assess the circuit performance; 7. Apply the negative feedback on electronic circuits to achieve specific performance and stability; 8. Design analogue circuits to meet performance criteria and select suitable components for circuit realization.
Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and group laboratory practical activities.
Required Reading: Roth, C.H., 2004 5th edition Fundamentals of Logic Design Thomson Learning Sedra, A. and Smith, K., 2004 5th edition Microelectronic Circuits Oxford University Press Chapman, S. J., 2002 Electric Machinery and Power System Fundamentals McGraw Hill
Assessment: Test, Mid-semester tests, 20%. Assignment, Semester assignments, 20%. Examination, End-of-semester examination, 60%.

ENE3200 ENGINEERING DESIGN AND PRACTICE 3B

Locations: Footscray Park.
Prerequisites:ENE3100 - ENGINEERING DESIGN AND PRACTICE 3A
Description: This unit is designed to create the opportunity for students to integrate generic skills with the learning and content from the concurrent third year subjects. The PBL approach to this unit of study requires students to form a holistic consideration of problems which are not only technical in nature but also exercise the students generic skills. Students are required to demonstrate critical thinking, problem solving skills, systems thinking and professional engineering practice. The unit is delivered in PBL mode and will encourage students to become independent

learners and self reflective about professional communication processes and practices.

Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply knowledge of basic science and engineering fundamentals. 2. Communicate effectively, not only with engineers but also with the community at large. 3. Apply in-depth technical competence in at least one engineering discipline. 4. Undertake problem identification, formulation and solution. 5. Utilise a systems approach to design and operational performance. 6. Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member. 7. Describe the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development. 8. Define the principles of sustainable design and development. 9. Describe the professional and ethical responsibilities and display a commitment to them. 10. Display a capacity to undertake lifelong learning. 11. Locate, evaluate, manage and use information effectively.

Class Contact: One hundred and twenty (120) hours for one semester comprising lectures, tutorials and group work.

Required Reading: Given the diverse nature of the Unit there is no set textbook for this module. However, study material will be handed out during the course of the Unit and this will be considered as essential reading.

Assessment: Other, Workshop attendance and participation, 10%. Presentation, Oral presentation, 10%. Presentation, Semester and final team product demonstration, 30%. Report, Written technical report, 30%. Portfolio, Reflective Journal Portfolio, 20%. In the portfolio students are required to demonstrate the attainment of learning outcomes using: peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports. .

ENE3201 ELECTRICAL MACHINES AND CONTROL

Locations: Footscray Park.

Prerequisites:ENE2101 - FUNDAMENTALS OF ELECTRICAL & ELECTRONIC CIRCUITSENE3101 - SYSTEMS ENGINEERING

Description: Electrical Machines: Balanced 3-phace systems; transformers, equivalent circuits and performance analysis; induction machines, equivalent circuits, performance analysis, starting methods; synchronous machines, generator characteristics and analysis, infinite bus, synchronous condenser and power factor calculations, motor operation of synchronous machines. Control Systems: Transfer functions. Root Locus. Introduction to P, PI, PID, lead, lag and lag-lead controllers. Time and frequency domain design of lead, lag and lag-lead controllers. Introduction to state-space models. State-Space and transfer function models conversion. Introduction to discrete-time control systems.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able: Appreciate fundamentals of mechanical and electromagnetic energy conversion; Analyse simple power systems containing transformers; Analyse and solve 3 phase AC power systems; Develop an understanding of the structure of A.C. electrical machines and the purpose of the various components; Develop equivalent circuit models for the machines; Calculate the operating characteristics of machines using the equivalent models (power, torque, efficiency, power factor etc.); Develop an understanding of starting dynamics of motors; Develop an understanding of appropriate applications of A.C. machines in industries; Display a basic understanding of the use of transfer functions, signal flow graphs and block diagrams in the description and analysis of control systems; Calculate an overall transfer function by use of both Mason s Gain Formula and Block Diagram Reduction; Appreciate the difference between real systems and the models of these systems; Show awareness of the limitations of simulation software; Write a quantitative specification of system performance; Use Root Locus Techniques to analyse the performance of LTI SISO systems; Perform analysis and design of continuous-time control systems with the use of Bode diagrams; Design P, PI, PID, lead, lag and lag-lead controllers to improve the behaviour of a LTI SISO systems; Display an introductory knowledge of state-space models; Use Matlab/Simulink to analyse the behaviour of LTI SISO systems (including use of LTI viewer and rltool); Display an introductory knowledge of discrete-time control systems. The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and laboratory work.

Required Reading: Bhag S. Guru, Huseyin R. Hiziroglu, 2001 3rd edition Electric Machinery and Transformers Oxford University Press Ives, R., 2008 Introduction to Control Systems 3B Lecture Notes Victoria University

Assessment: Laboratory Work, Laboratory assessment, 20%. Test, Mid-semester test, 20%. Examination, End-of-semester examination, 60%.

ENE3202 EMBEDDED AND NETWORKED SYSTEMS

Locations: Footscray Park.

Prerequisites:ENE2202 - ELECTRONIC SYSTEMS

Description: This unit extends the study of Embedded Computing from year 2 of the program and introduces the principles of operation of networked computer systems. The unit includes the learning of basic concepts of computer communication. Data and signals, Frequency Spectrum and bandwidth, Data encoding, Framing and synchronisation. Modulation of data, Modems. Physical layer interfaces. Transmission of data, Transmission media, Multiplexing. Error detection and correction. Data link control, Data link protocols. Local area networks. The Embedded Systems area includes system design involving real-time constraints, Pulse Width Modulation for actuator control, sensor interfacing using direct digital sensors and analogue to digital conversion , inter-device communication using industry standard methods:- USART, SPI, I2C and CAN.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe basic principles and techniques used in computer data communication. 2. Analyse a situation that requires a computer networking system and make recommendations on the system specification and formulate an implementation plan. 3. Analyse an industrial control system application and derive an embedded system specification for the application 4. Implement a real-time, embedded industrial control system using an embedded microcontroller with associated interface and communication devices.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and group practical activities.

Required Reading: Mazidi, McKinlay and Causey, 2008 PIC Microcontroller and Embedded Systems using Assembly Language and C for PIC18 Pearson/Prentice-Hall Forouzan. B., Fagan. S. C., 2006 Data Communication and Networking McGraw Hill

Assessment: Test, Mid-semester test, 20%. Assignment, Semester assignment, 10%. Examination, End-of-semester examination, 70%.

ENE3203 POWER ELECTRONICS AND MACHINES

Locations: Footscray Park.

Prerequisites:ENE2101 - FUNDAMENTALS OF ELECTRICAL & ELECTRONIC CIRCUITS
Description: This unit of study is intended to provide a sound knowledge of induction and synchronous machines including equivalent circuits, performance analysis based on the equivalent circuits, and operating characteristics under varying operating conditions. Power electronics theory and applications: AC-DC conversion, DC-DC switching, and motor speed controls The syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial, the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented. Unit Content Introduction to induction motor and rotating field. Equivalent circuit of an induction motor. Power, torque, efficiency, power factor calculations. Induction motor starting. Speed control of induction motor. Introduction to synchronous machines. Synchronous motors and their characteristics. Synchronous generators. Loci of synchronous motor. Synchronous motor starting. Introduction to the theory, design and analysis of conversion of electric power by means of power electronics, including AC to DC and DC to DC power converters. The fundamental knowledge of electronic speed control techniques for DC motor drives for different applications. AC-DC single-phase and three-phase power converters: Diode and SCR bridge rectifiers. DC-DC Switching Mode Power Converters, buck converters and boost converters, Buck-boost converters. Unipolar and bipolar voltage switching method. Fly-back converters, push pull converters. First quadrant, two quadrant and four quadrant drive. Different electronic speed control techniques for DC motor drives.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to :

- Develop equivalent circuit models for the machines.
- Calculate the operating characteristics of machines using the equivalent models (power, torque, efficiency, power factor etc.).
- Show an understand the starting dynamics of motors.
- Display and understanding of appropriate applications of A.C. machines in industries.
- Display an understanding of the basics and operations of power semiconductor switches.
- Define the building blocks of power electronics conversion.
- Analyse AC/DC and DC/DC power converters.
- Analyse and design different types of switching power supplies in different modes of operation.
- Demonstrate the knowledge of electronic speed control techniques for DC motor drives for different applications.

10. Demonstrate the knowledge of electronic speed control techniques for DC motor drives for different applications.

Class Contact: Sixty (60) hours for one semester comprising Lectures, Tutorials and Laboratory work.
Required Reading: Theodore Wildi, 2002, fifth Edition, Electrical Machines, Drives and Power Systems, Prentice Hall. N. Mohan, T. M. Undeland & W. P. Robbins, 2003, Power Electronics - Converters, Applications, and Design, John Wiley & Sons.
Assessment: Test, Test, 20%. Laboratory Work, Laboratory, 15%. Examination, Written, 65%.

ENE4100 ENGINEERING DESIGN AND PRACTICE 4A

Locations: Footscray Park.
Prerequisites: Completion of all 3rd year units.
Description: Students will commence a major engineering project resulting in a complete and working outcome which meets the agreed specifications and demonstrates an understanding of relevant professional engineering standards. The project will continue in the follow-on second semester unit ENE4200.The student will define the problem, develop functional specifications (in collaboration with the project supervisors), and write a concise project contract and comprehensive project plan. A feasibility study is the next stage. Possible alternative engineering solutions are conceptualised and evaluated using objective criteria functions. Cost, reliability, sustainability and environmental impacts should also be considered in choosing the best approach, which the student should be able to defend in an objective way. All progress work on the design should be documented in notebooks. Written progress reports, oral presentation and interim product demonstrations will be required during the course of the problem. This unit includes a mandatory series of lectures on professional conduct and ethics.
Credit Points:24
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Undertake problem identification, formulation and solution; 2. Demonstrate an understanding of environmental and sustainability issues in problem solution; 3. Utilise a systems approach to complex design problems; 4. Demonstrate the ability to synthesise solutions, and use analysis to verify designs, using computing tools where appropriate; 5. Demonstrate skills in prototyping and testing engineering projects; 6. Display capabilities in managing a project, designing to specification, and meeting the sponsor's outcomes and reporting timelines; 7. Demonstrate the ability to manage information and documentation; 8. Interface with and communicate with other designers who may be working on related project tasks; 9. Display the capacity to write a competent feasibility study, and progress report; 10. Display fluency in delivering oral progress presentations to external sponsors. 11. Demonstrate proper and ethical professional conduct.
Class Contact: One hundred and twenty (120) hours or equivalent for one semester comprising of Individual project work generally outside of formal classes. However, students are expected to maintain regular weekly contact with their academic and industrial Supervisors. There will be lectures provided in Project and Business Management and technical lectures and workshops will be organised as required by the project. The project Sponsor will usually be someone other than the project Supervisor, and some will be external to the University. Where this occurs, the student is should establish a communications protocol (i.e. decide on the mode and frequency of the communication) with the Sponsor early on in the project. This will ensure that communication with the Sponsor is appropriate and effective.
Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.
Assessment: Report, Feasability Study, 20%. Project, Project Contract, 10%. Project, Project Plan, 20%. Presentation, 1st Progress Presentation, Interim Demonstration and Progress Report, 50%.

ENE4101 ANALOG AND OPTOELECTRONICS

Locations: Footscray Park.
Prerequisites:ENF1202 - ENGINEERING PHYSICS 2ENE3102 - SYSTEMS & APPLICATIONS
Description: This unit provides students with knowledge in analogue electronic, Integrated Circuits, semiconductors, functions and applications in electrical engineering systems and, in particular, an introduction to photonics and

optoelectronics. In this unit students will be presented with a description of the nature of light, the generation of light (light sources and their properties such as lasers, light emitting diodes), the transmission of light (optical fibres and waveguides, optical amplifiers), and detection. The primary delivery means of the syllabus will be by lecture, supported by project-based laboratories.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Perform analysis and design calculations on common electronic circuits; 2. Design electronic circuit for specific application to meet performance criteria and select suitable components for the circuit realisation; 3. Calculate performance characteristics on semiconductor devices including light emitting and laser diodes and photodectors; 4. Calculate performance characteristics in solar cells; 5. Determine operating characteristics of single mode and multimode optical fibres; 6. Determine losses and dispersion in optical fibres; 7. Use properties of light to interact with the environment for sensing applications.

Class Contact: Sixty (60) hours or equivalent for one semester comprising of lectures, tutorials and laboratory projects.

Required Reading: Palais, J.C., 2004 5th edn Fibre Optic Communications Prentice Hall: N.J Sedra A & Smith K., 2004 5th edn Microelectronic Circuits Oxford University Press

Assessment: Test, Class test, 25%. Project, Projects throughout semester, 50%. Examination, End-of-semester examination, 25%.

ENE4200 ENGINEERING DESIGN AND PRACTICE 4B

Locations: Footscray Park.

Prerequisites: ENE4100 - ENGINEERING DESIGN AND PRACTICE 4A

Description: In this unit, students will continue and complete a major engineering project begun in ENE4100. Written progress reports, oral presentation, and a final product demonstrations and presentation will be required during the course of the project. The final report should document the complete design process, the synthesis and analysis of the design, prototyping, experimental testing, refinement of the design, the final product and full performance testing and comparison with the specifications.

Credit Points: 24

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Undertake problem identification, formulation and solution; 2. Utilise a systems approach to complex design problems; 3. Display skills in prototyping, realising and testing engineering projects to meet agreed specifications; 4. Display capabilities in managing a project, designing to specification, and meeting the sponsor's outcomes and reporting timelines; 5. Manage information and documentation; 6. Interface with and communicate with other designers who may be working on related project tasks; 7. Display the capacity to write a comprehensive final report; 8. Show fluency in delivering oral progress presentations to external sponsors.

Class Contact: One hundred and twenty (120) hours or equivalent for one semester comprising of individual project work generally outside of formal classes. However, students are expected to maintain regular weekly contact with their academic and industrial Supervisors. Technical lectures and workshops will be organised as required by the project. The project Sponsor will usually be someone other than the project Supervisor, and some will be external to the University. Where this occurs, the student is should establish a communications protocol (i.e. decide on the mode and frequency of the communication) with the Sponsor early on in the project. This will ensure that communication with the Sponsor is appropriate and effective.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Presentation, Interim Progress Presentation and Report, 20%. Presentation, Final Product Demonstration, 30%. Presentation, Final Oral Presentation, 10%. Report, Final Report, 40%.

ENE4201 MEASUREMENT SYSTEMS ENGINEERING

Locations: Footscray Park.

Prerequisites: Completion of 2nd year in an appropriate B.Eng., B.Eng.Sc., B.Sc., B.App.Sc. or B.Ed. course.

Description: The importance of measurement; the measurement process. Measurement System Architecture: Classification of transducers, sensors, actuators and modifiers, energy matrices, developing a measurement system block diagram. Measurement System Performance: Static performance, environmental effects, modelling static performance, modelling dynamic performance. Error and Uncertainty: Units, standards, traceability, calibration, accreditation, specifying uncertainty, calculation of uncertainty. Sensors: The sensor interface, sensors for common measurands, signal conditioning Signals and Information in Measurement Systems: data acquisition systems, signal behaviour within systems, noise and noise reduction. Creating and Testing Measurement Systems: Specification, selection and decision-making, quality and reliability aspects of measurement systems, evaluation, installation and commissioning. Case Studies: Design case studies of commercial measurement systems. Current Issues and Trends in Measurement Systems: Intelligent systems, distributed measurement systems Modelling the Measurement System: Introduction to LabVIEW.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Understand and utilise the key theoretical and practical issues relevant to the design and realisation of measurement systems; 2. Model, realise and evaluate the solution to a practical measurement problem.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and laboratory work.

Required Reading: Bishop, R. H., 2004 Learning with LabView 7 Express Pearson Prentice Hall, Upper Saddle River, NJ

Assessment: Project, Projects and reports throughout semester, 60%. Examination, End-of-semester examination, 40%.

ENE4202 WIRELESS AND BROADBAND COMMUNICATIONS

Locations: Footscray Park.

Prerequisites: ENE3101 - SYSTEMS ENGINEERINGCompletion of the Second Year of degree.

Description: Overview of digital modulations with emphasis on wireless applications: QPSK, MSK, GMSK, QAM. Vector space representation of digital signals, Correlation receiver, Matched filter receiver, Signal-space representation of noise, Maximum likelihood sequence estimation (MLSE) detector, Performance in AWGN channels. CDMA. OFDM and its application to wireless LAN and ADSL, Cellular System Engineering, GSM, WCDMA. Layered structure of computer communication protocols. ISO OSI 7 layer model and TCP/IP protocol suit. LANs. Ethernet. WANs. PPP. X..25. Frame relay. ATM. Network connecting devices. Repeaters, hubs, bridges, routers, and gateways. IP and IP addressing. Sub-netting and super-netting. Routing protocols. ARP and RARP. ICMP and IGMP. Transport layer protocols. UDP and TCP. Flow control, error control, and congestion control in TCP. Routing protocols. RIP, OSPF, and BGP. Multicast routing. Application layer. Concurrent clients and servers. BOOTP and DHCP. Domain name system. Socket interface. FTP and TFTP. SMTP. SNMP. HTTP. WWW

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Explain digital communications and modulation as used in weird and wireless transmission; Explain receiver techniques for digital modulation links; Introduce key wireless systems. GSM, WCDMA and WLAN; Discuss the basic principles involved in data communication systems; Explain the data network architecture, operation, and performance analysis; Evaluate the protocols employed in data networks; Explain the particular aspects of local area and wide area networks; Discuss wireless networks, their operation, and interfacing with network backbone; Explain the analytical techniques employed in data network performance estimation; Explain the basic queuing theory and its application to data networks; Describe data network switching and switching systems; Discuss the principles involved in data network design and the heuristic algorithms employed; Explain cost effective designs of local and wide area networks. Explain information theory, source coding, and data compression. The Learning Outcomes of this unit of study will also depend upon the material presented, as required to support the concurrent Engineering Design exercises.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and laboratory work.

Required Reading: Forouzan, B.A., 2003 'TCP/IP Protocol Suite' McGraw Hill Haykin, S. 2001 4th Edition Communication Systems John Wiley & Sons.

Assessment: Laboratory Work, Continuous assessment in laboratory work., 20%. Test, Mid-semester, 20%. Examination, Final, 60%.

ENE4203 ALTERNATIVE ENERGY SYSTEMS AND POWER ELECTRONICS

Locations: Footscray Park.

Prerequisites: Nil.

Description: Part A - Alternative Energy Systems: Part A reflects on the concept of sustainability in the electrical energy generation sector in order to provide the basis for the consideration of alternative energy systems. Part A will revise conventional energy systems and the emissions associated with these systems. Then, the students will be introduced to unconventional energy sources such as solar, wind, biomass and fuel cells as well as energy storage technologies. Technical properties, environmental and economic advantages of these technologies will be discussed and learning activities will focus on mathematical modelling, and analysis of these alternative generation technologies. Finally, Part A will focus on the design of hybrid systems and their integration to existing distribution and transmission systems. Part B - Power System Communication: Part B provides an introduction to the power system automation, control, and communication concepts and technologies, which are integral elements of a state of the art power system network, i.e. a smart grid. Power system automation, protection and control concepts will be studied with examples from real world applications such as SCADA technologies. Part B will also review the communication technologies, network topologies, and standardization efforts in the power systems communication arena, and discuss the relevant standards, communication architectures, and protocols developed for use in these networks. Security concerns in power system communication networks will be outlined and the importance of developing and maintaining a secure network against cyber-attacks will be further elaborated.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Compare and analyse different alternative energy sources and their availability; 2. Assess the design and operation principles of alternative energy systems; 3. Analyse economic and environmental impact of the alternative energy systems; 4. Examine current applications of alternative energy systems; 5. Examine the role of communications in power system networks and various communication requirements needed in power system protection and distribution networks; 6. Evaluate the need for the use of communication media and architectures in power systems; 7. Appraise the value that the global organisations like IEC and EPRI bring to the development of new technologies and structures for the advancement of power systems; 8. Comprehend and justify the need for system automation, control, and integration concepts; 9. Comprehend and demonstrate the need and value for the communication standards, protocols and architectures most commonly employed in power system protection and distribution networks; 10. Comprehend, revise and argue for the importance of security and contingency analysis in the operation of power system networks; 11. Understand and formulate the different instrumentation used in power systems; 12. Display a good understanding about the structure of the National Electricity Market in Australia and interpret how it operates with a focus on operational metering, tariffs and wholesale energy trading.

Class Contact: Sixty (60) hours for one semester comprising Lectures, Tutorials and Laboratory work.

Required Reading: Masters, G. 2004, 1st edn, Renewable and Efficient Electric Power Systems, John Wiley & Sons, Hoboken, NJ. Ozansoy, C. 2010, 1st edn, Modelling and Object Oriented Implementation of IEC 61850, Lambert Academic Publishing, Saarbrucken, Germany. Boyle, G. 2004, 2nd edn, Renewable Energy: Power for a Sustainable Future, Oxford University Press, Oxford. Kalam, A and Kothari, D. P. 2009, 1st edn, Power System Protection and Communications, New Age International (P) Ltd.

Assessment: Test, 1 Hour Mid-Semester Test, 20%. Examination, 3 Hour Examination, 50%. Laboratory Work, 2 Laboratory Group Reports (Team of two, 1000 words each), 30%. Test: Learning Outcomes 1,2,3 and 4, and Graduate Capabilities 1, 2, 3, and 4. Examination: Learning Outcomes 1-12, and Graduate Capabilities 1, 2, 3, and 4. Laboratory Work: Learning Outcomes 1-12, and Graduate Capabilities 1, 2, 3, 4, 5 and 6. .

ENE4204 COMPUTER AND FUZZY LOGIC CONTROL SYSTEMS

Locations: Footscray Park.

Prerequisites: ENE3201 - ELECTRICAL MACHINES AND CONTROL

Description: Pulse transfer functions. Conversion of a continuous-time transfer function model into a zero-order hold equivalent pulse transfer function model. Convert between pulse transfer function models and difference equation models. Analysis and design of discrete-time control systems with the Root Locus method and Bode diagrams in conjunction with the Bilinear transformation. Performance trade-off in control design problems. Introduction to fuzzy sets theory: fuzzy set definitions, properties of fuzzy sets, operations on fuzzy sets. Fuzzy relations: classical relations, fuzzy relations, operation on fuzzy relations, the extension principal. Natural language formalisation and approximate reasoning: linguistic variables, fuzzy propositions, fuzzy if - then statements, inference rules. Theoretical fundamentals of fuzzy control: the structure of a fuzzy controller, the rule base, the data base, the inference engine, choice of fuzzification and defuzzification procedures. Fuzzy controller design and implementation. Applications of fuzzy control.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Explain the basis of use of pulse transfer functions in the description and analysis of computer controller systems. Convert a continuous-time transfer function model into a zero-order hold equivalent pulse transfer function model. Convert between pulse transfer function models and difference equation models. Perform analysis and design of discrete-time control systems with the Root Locus method. Perform analysis and design of discrete-time control systems with the use of Bode diagrams in conjunction with the Bilinear transformation. Explain the need of performance trade-off in control design problems. Define the basic mathematical concepts of fuzzy sets. Describe the structure of fuzzy logic controller. Design and implement fuzzy logic controller. Use MatLab/Simulink to analyse and design discrete-time and fuzzy logic control systems. Use the DSpace DS1102 DSP card and Real-Time Workshop for rapid prototyping of discrete-time and fuzzy logic control systems. The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials and laboratory work.

Required Reading: Ogata, K., 1995 Discrete-Time Control Systems, Prentice-Hall K.M. Passino and S. Yurkovich, 1998 Fuzzy Control Addison-Wesley,

Assessment: Laboratory Work, Laboratory Work, 30%. Test, Mid-semester, 20%. Examination, Final, 50%.

ENE4205 DIGITAL SYSTEM DESIGN

Locations: Footscray Park.

Prerequisites: ENE3102 - SYSTEMS & APPLICATIONS

Description: This unit extends the study of digital electronics for year 2 into a systems level design approach based on the use of top-down design methods and implementation on very large scale programmable logic devices including simple and Complex Programmable Logic Devices (PLDs) and Field Programmable Gate Arrays (FPGAs). The design approach employs the partitioning of the task into a controller and associated data-processing sections. Synchronous and asynchronous approaches are examined along with optimization methods for operational speed and logic circuit gate count. The unit also includes the use of modern Computer Aided Engineering (CAE) tools and the study of the automated logic synthesis method.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Design simple and complex digital systems using the ASM and RTL design methods; 2. Implement designs on small and complex PLDs and FPGAs; 3. Use modern Computer Aided Engineering (CAE) tools to predict design performance in terms of power consumption, propagation delay etc. and optimize according to application requirements; 4. Describe the principle of operation of automated logic synthesis software and be able to "guide" the synthesis process through the structure of a VHDL hardware description; 5. Prepare manufacturing information for the transfer of a design from an FPGA onto a mass produced "hard copy" version.

Class Contact: Sixty (60) hours or equivalent for one semester comprising:- lectures, tutorials and group practical activities.

Required Reading: Dueck, R.K. 2005 2nd edition, Digital Design with CPLD Applications and VHDL, Thomson Learning Hamblen, J.O. 2001 2nd edition, Rapid Prototyping of Digital Systems: A Tutorial Approach, Kluwer Academic Pub

Assessment: Assignment, Assignment, 20%. Test, Mid-semester, 20%. Examination, Final, 60%.

ENE4206 HETEROGENEOUS SYSTEMS

Locations: Footscray Park.

Prerequisites: Nil.

Description: Overview of current trends in semiconductor technology, fundamental physical and economic constrains, technology roadmap for semiconductors, challenges and needs for nano-electronics, organic and molecular microelectronics, system implementation issues, development of mixed signal and RF systems, MEMS, and VLSI circuits for biomedical applications. The syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit of study will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe current trends in semiconductor technology; 2. Display knowledge of simulation and design of heterogeneous systems; 3. Carry out significant tasks designed to improve desired generic skills and attributes.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures, tutorials, laboratory work, and project work.

Required Reading: Luryi, et al., 2004 Future Trends in Microelectronics,

Assessment: Laboratory Work, Laboratory based exercies., 30%. Project, Project, 30%. Examination, Final, 40%.

ENE4207 ALTERNATIVE ENERGY SYSTEMS AND POWER SYSTEM COMMUNICATION

Locations: Footscray Park.

Prerequisites: Nil.

Description: Part A - Alternative Energy Systems: Part A reflects on the concept of sustainability in the electrical energy generation sector in order to provide the basis for the consideration of alternative energy systems. Part A will revise conventional energy systems and the emissions associated with these systems. Then, the students will be introduced to unconventional energy sources such as solar, wind, biomass and fuel cells as well as energy storage technologies. Technical properties, environmental and economic advantages of these technologies will be discussed and learning activities will focus on mathematical modelling, and analysis of these alternative generation technologies. Finally, Part A will focus on the design of hybrid systems and their integration to existing distribution and transmission systems. Part B - Power System Communication: Part B provides an introduction to the power system automation, control, and communication concepts and technologies, which are integral elements of a state of the art power system network, i.e. a smart grid. Power system automation, protection and control concepts will be studied with examples from real world applications such as SCADA technologies. Part B will also review the communication technologies, network topologies, and standardization efforts in the power systems communication arena, and discuss the relevant standards, communication architectures, and protocols developed for use in these networks. Security concerns in power system communication networks will be outlined and the importance of developing and maintaining a secure network against cyber-attacks will be further elaborated.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Compare and analyse different alternative energy sources and their availability; 2. Assess the design and operation principles of alternative energy systems; 3. Analyse economic and environmental impact of the alternative energy systems; 4. Critically examine current applications of alternative energy systems; 5. Assess the role of communications in power system networks and various communication requirements needed in power system protection and distribution networks; 6. Evaluate the need for the use of communication media and architectures in power systems; 7. Analyze the value that the global organisations like IEC and EPRI bring to the development of new technologies and structures for the advancement of power systems; 8. Identify and evaluate the need for system automation, control, and integration concepts; 9. Summarise communication standards, protocols and architectures most commonly employed in power system protection and distribution networks; 10. Formulate principles for the importance of security and contingency analysis in the operation of power system networks; 11. Formulate different instrumentation used in power systems; 12. Identify essential aspects the structure of the National Electricity Market in Australia and critcally assess its operations with respect to operational metering, tariffs and wholesale energy trading.

Class Contact: Sixty (60) hours for one semester comprising Lectures, Tutorials and Laboratory work.

Required Reading: Masters, G. 2004, 1st edn, Renewable and Efficient Electric Power Systems, John Wiley & Sons, Hoboken, NJ. Ozansoy, C. 2010, 1st edn, Modelling and Object Oriented Implementation of IEC 61850, Lambert Academic Publishing, Saarbrucken, Germany. Boyle, G. 2004, 2nd edn, Renewable Energy: Power for a Sustainable Future, Oxford University Press, Oxford. Kalam, A and Kothari, D. P. 2009, 1st edn, Power System Protection and Communications, New Age International (P) Ltd.

Assessment: Test, 1 Hour Mid-Semester Test, 20%. Examination, 3 Hour Examination, 50%. Laboratory Work, 2 Laboratory Group Reports (Team of two, 1000 words each), 30%. Test assesses: Learning Outcomes 1,2,3 and 4, and Graduate Capabilities 1, 2, 3, and 4. Examination assesses: Learning Outcomes 1-12, and Graduate Capabilities 1, 2, 3, and 4. Laboratory Work assesses: Learning Outcomes 1-12, and Graduate Capabilities 1, 2, 3, 4, 5 and 6.

ENF1101 ENGINEERING MATHEMATICS 1

Locations: Footscray Park.

Prerequisites: Year 12 Mathematics or its equivalent.

Description: Basic algebra, including index, log laws, indicial and log equations, absolute value, inequalities, algebraic expansions; functions, straight line, parabola, ellipse, hyperbola etc., domain, range, inverse functions; trigonometric identities, functions and their graphs, period amplitude, frequency, inverse trigonometric functions. Limits, continuity, derivatives of polynomials, trigonometric, logarithms and exponentials functions, differentiation rules, higher derivatives, concavity of graph, implicit differentiation. Statistics, frequency distribution, histograms, mean, mode, median, range, variance, standard deviation, Normal distribution; probability, expectation of events from an experiment, mutually exclusive and independent events, permutations and combinations, binomial and Poisson probability distributions, normal curve, confidence limits. Parametric differentiation; tangents and normal lines, derivatives of logs and exponentials; Newton-Raphson method, rates of change, maximum and minimum problems, small change. Introduction to integration, definite integral, fundamental theorem of integral calculus; Integration methods, substitution technique, integration by parts, partial fractions; areas, mean value of a function; methods of integration, partial fractions, simple integration by parts.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Solve and graph functions; 2. Perform basic differentiation and integration; 3. Apply calculus to engineering-related problems; 4. Perform statistical analysis on real data and make valid inference from samples.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorials.

Required Reading: James, G., 2007 4th edn Modern Engineering Mathematics Pearson Prentice Hall

Assessment: Test, Weekly in-class tests, 15%. Test, Mid-semester test, 35%. Examination, End-of-semester examination, 50%.

ENF1102 ENGINEERING PHYSICS 1

Locations: Footscray Park.

Prerequisites: Nil

Description: Units and measurements: Physical units and dimensions, unit conversions, significant figures, uncertainty calculations. Mechanics: Scalars and vectors, resolving of vectors, unit vectors, vector algebra; displacement, velocity and acceleration, one-dimensional motion, two-dimensional motion; Newton's laws and forces, equilibrium of forces, friction, work, energy; conservation of energy, impulse and momentum; Waves and Sound: Simple harmonic motion (SHM), damped harmonic motion, forced oscillations and resonance, oscillatory motion, mechanical and acoustic waves, superposition and standing waves, Doppler effect.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Use Newton's laws to calculate displacement, velocity and acceleration; 2. Apply the rules of conservation of energy and momentum to engineering-related problems; 3. Apply the principles of SHM and waves to engineering-related problems; 4. Perform calculations on sound intensity levels and the Doppler effect in engineering-related problems.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and laboratory work.

Required Reading: Giancoli, D.C., 2008 4th Edition Physics for Scientists and Engineers with Modern Physics Prentice Hall

Assessment: Report, Laboratory report/ assignment , 20%. Test, Weekly in-class tutorial tests, 30%. Examination, End-of-semester examination, 50%.

ENF1103 ENGINEERING AND THE COMMUNITY

Locations: Footscray Park.

Prerequisites: Nil

Description: In this unit, students will explore the role and importance of engineering in society, at both the national and international level. This will include identifying issues facing engineers such as sustainability; existing trends and practices; and innovations to meet future challenges. Students will examine the development of Engineering as a profession and look at the varying disciplines within the profession. This will enable students to establish their own learning and career goals and develop strategies to achieve those goals. Students will also examine the activities that constitute the engineering method, a problem-solving process, and apply the method to an identified problem. Students will learn about the various stages of a project and how to use project management processes for managing projects. Students will work on a number of deliverables that will require them to work both individually and collaboratively, and communicate their work and findings in oral and written forms.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Identify the key roles of engineering in the local and global communities; 2. Describe the key features of the different disciplines of engineering practice; 3. Develop their own learning and career goals, and use self-management skills to plan and manage their work 4. Identify ethical and sustainability issues in engineering practice; 5. Comprehend strategies for practising sustainable engineering and how to evaluate a solution in terms of environmental, social and economic costs and benefits 6. Recognise the professional responsibilities of engineers and aspects of ethical engineering practice 7. Describe the engineering method as well as the activities that constitute this problem-solving process and apply the method to an identified problem. 8. Identify and plan the various stages of a project and utilise project management processes to manage a project 9. Communicate effectively with others by writing on a range of engineering-related topics using appropriate language; 10. Communicate effectively with others by oral and visual presentation on a range of engineering-related topics using appropriate language; 11. Work individually and with others, as both a team member and leader in both formal and informal teams, to complete tasks.

Class Contact: Sixty (60) hours for one semester comprising of lectures, tutorials and field trips.

Required Reading: Dowling, D, Carew, A, Hadgraft, R, 2013. 2nd edn. Engineering Your Future: an Australasian Guide. John Wiley and Sons Australia, Milton, Queensland. VU, Faculty of Arts, 2009. 9th edn. Communication Skills Handbook for First Year Students in the Faculty of Health, Engineering and Science. Victoria University.

Assessment: Assignment, 1 Team Project Report of 3000 Words, 60%. Presentation, 1 Team Oral Presentation - 15 Minutes, 20%. Exercise, Individual Reflection Exercise - 1000 Words, 20%. Assignment Assesses: Learning Outcomes 4, 5, 7, 8, 9, 11 and Graduate Capabilities 1, 2, 3, 4, 5 Presentation Assesses: Learning Outcomes 1, 2, 3, 4, 5, 6, 10 and Graduate Capabilities 2, 3, 4 Exercise Assesses: Learning Outcomes 1, 2, 3, 4, 5, 6, 9 and Graduate Capabilities 2, 3, 4, 5, 6 .

ENF1104 PROBLEM SOLVING FOR ENGINEERS

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit is based on a series of problems designed to both introduce students to systematic problem solving methods and to apply knowledge introduced in other first year semester 1 units. The problems will focus on a range of issues related to engineering practice and sustainability. Students will be required to undertake data analysis and manipulation using various computing tools, including spreadsheet software and fundamental programming techniques.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply fundamental knowledge of mathematics and science to solving engineering problems; 2. Apply systematic approaches to solving engineering problems; 3. Undertake data analysis and manipulation using various computing tools, including spreadsheet software and fundamental programming techniques; 4. Identify and respond to broad sustainability issues in finding solutions to engineering problems; 5. Work individually and collaboratively, as both a team member and leader, to complete tasks and evaluate own and others' performance; 6. Demonstrate reflection of learning by keeping a personal journal; 7. Demonstrate safe laboratory practices and an ability to identify potential safety hazards.

Class Contact: Sixty (60) hours for one semester comprising of team workshops, supporting lectures and labs.

Required Reading: VU 2009, School of Engineering and Science, 2nd edn., PBL in Engineering Manual, Victoria University, Melbourne, Australia. VU 2013, College of Arts, 10th edn., Handbook of Communication Skills for First Year Students in the College of Engineering and Science, Victoria University, Melbourne, Australia.

Assessment: Portfolio, Individual Portfolio, 20%. Report, 4 Team Project Reports (1000 words each), 40%. Test, 4 Class Tests, 40%.

ENF1201 ENGINEERING MATHEMATICS 2

Locations: Footscray Park.

Prerequisites: ENF1101 - ENGINEERING MATHEMATICS 1

Description: Matrices, determinants, Cramer's rule matrix algebra, special matrices, matrix inversion, solution of simultaneous equations by matrix inversion. First order linear differential equations (DE's) with constant coefficients, separable DE's, integrating factor, homogenous method, initial value problems; first order DE's in engineering applications. Second-order linear DE's with constant coefficients, second order homogenous linear DE's, simple double and complex roots of auxiliary equation; second order linear DE's in engineering applications. Algebra with complex numbers, Argand diagram, complex conjugate, modulus and argument, polar form, exponential form. Introduction to series and some convergence tests, radius of convergence; Taylor series, Maclaurin series, convergence of power series. Partial differentiation, higher order derivatives, chain rule, engineering applications of partial derivatives—maxi/min, approximate value.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Use matrices to solve simultaneous linear equations; 2. Apply first order and second order differential equations to engineering-related problems; 3. Perform simple complex number calculations; 4. Test series for convergence and use Maclaurin method to generate power series; 5. Apply partial differentiation to engineering problems.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorials.

Required Reading: James, G., 2007 4th edn Modern Engineering Mathematics Pearson Prentice Hall

Assessment: Test, Weekly in-class tests, 15%. Test, Mid-semester test, 35%. Examination, End-of-semester examination, 50%.

ENF1202 ENGINEERING PHYSICS 2

Locations: Footscray Park.

Prerequisites: ENF1102 - ENGINEERING PHYSICS 1

Description: Electricity and magnetism: Electric charges, forces and fields, electric flux and potential, magnetic forces and fields, electromagnetic induction. Electric circuits: Ohm's law, resistors in series and parallel, equivalent resistive circuits, AC and DC sources, RMS values in AC/DC circuits, Kirchhoff's laws, single loop circuits, multi-loop circuits, voltage dividers. Thermodynamics: Temperature, thermal expansion, heat capacity, specific and latent heat, ideal gases, work and heat in the thermal process, first law of thermodynamics, heat engines and the second law of thermodynamics.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply principles of electric and magnetic fields to engineering-related problems; 2. Calculate the forces acting on charged particles in electric and magnetic fields; 3. Apply Ohm's law and Kirchhoff's laws in single-loop and multi-loop circuits; 4. Apply principles of heat and temperature to engineering-related problems.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and laboratory work.

Required Reading: Giancoli, D.C., 2000 3rd Edition Physics for Scientists and Engineers with Modern Physics Prentice Hall

Assessment: Report, Laboratory reports/ assignments, 20%. Test, Weekly in-class tutorial tests, 30%. Examination, End-of-semester examination, 50%.

ENF1203 ENGINEERING COMPUTING

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit covers the following topics: Introduction to the fundamentals of computers, introduction to the application of computers to solving engineering problems, modern computer programming environments, storage and retrieval of data and information, organisation of data in rows and columns, operations on matrices, introduction to programming languages. It also covers fundamental programming concepts that include: variables, iteration, loops, logical operations, functions, Boolean operators, graphical representation of engineering data in 2D and 3D, histograms, the least squares method and curve fitting., engineering applications of numerical differentiation and integration, principles of measurement and fundamentals of measurement systems.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Use computers in a variety of engineering contexts; 2. Use high level programming language to store, retrieve, visualise and analyse engineering data; 3. Develop computer programs to solve a range of engineering problems; 4. Use computerised data acquisition and measurement systems.

Class Contact: Sixty (60) hours for one semester comprising of lectures, tutorials and workshops.

Required Reading: Stormy Attaway, 2009. MATLAB: A Practical Introduction to Programming and Problem Solving Butterworth-Heinemann

Assessment: Laboratory Work, Weekly laboratory assessment, 20%. Examination, End-of-semester 2 hr examination , 50%. Project, 2 mini projects, 30%. Student must pass all components of the assessments.

ENF1204 INTRODUCTION TO ENGINEERING DESIGN

Locations: Footscray Park.

Prerequisites: Nil

Description: This unit is based on a series of problems designed to both introduce students to the design process and to apply knowledge introduced in other Year 1 units of study. The problems will therefore emphasise creative thinking in design, generating and evaluating alternatives against a range of technical, environmental, social and economic criteria, and making the final design decisions. The unit also incorporates a module on professional drawing practice including projections and views, dimensioning, different drawing types and using computer-aided design (CAD) software.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply a systematic approach to engineering design; 2. Find, organise and evaluate information on a range of topics related to problems in engineering design; 3. Identify and evaluate technical, environmental, social and economic factors impacting on the solution of engineering design problems; 4. Use computer-aided design (CAD) software to develop and present design solutions; 5. Communicate effectively with others orally, in writing and by means of engineering drawings; 6. Demonstrate an ability to learn individually and collaboratively in a team environment; 7. Use a personal reflective journal and demonstrate improvements in their effectiveness as learners; 8. Respond to diverse learning situations in a socially and culturally responsible manner.

Class Contact: Sixty (60) hours for one semester comprising of team workshops, including supporting lectures and labs.

Required Reading: Vallero, D.A, and Brasier, C, (2008) Sustainable Design: The Science of Sustainability and Green Engineering Richmond: Wiley VU, School of Engineering and Science, (2009) 2nd edn PBL in Engineering Manual Melbourne: Victoria University VU, Faculty of Arts, (2009) 9th edn Communication Skills Handbook for First Year Students in the Faculty of Health, Engineering and Science Melbourne: Victoria University

Assessment: Report, Teamwork including technical reports (4000-5000 words as a cumulative total for a team of 4 students per semester), 45%. Portfolio, Individual portfolio (additional 1000 words which excludes the copies of the reports which are part of the portfolio), 25%. Test, 2 Short individual tests on design in class, 10%. Presentation, Team Oral Presentation (5 minutes per student), 5%. Test, CAD Skill, 15%. Report: Learning Outcomes 1,2,3,5,6,&8 and Graduate Capabilities 1, 2, 3, 4, 5 and 6 Portfolio: Learning Outcomes 5,6,&7 and Graduate Capabilities 3 and 4 Short Test: Learning Outcome 6 and Graduate Capabilities 2, 4 and 6 Presentation: Learning Outcome 5 and Graduate Capabilities 3, 4, 5,and 6 Cad Skill Test: Learning Outcome 4,5 & 6 and Graduate Capabilities 2, 3, 4 and 6 .

EPS4100 ELECTRICAL POWER SYSTEMS, ANALYSIS AND OPERATION

Locations: Footscray Park.

Prerequisites:ENE3201 - ELECTRICAL MACHINES AND CONTROL

Description: An outline of the electricity distribution in the deregulated Australian power industry will be given. Network calculations and the bus-admittance matrix will be covered. The concept of load flow analysis will be studied. The Gauss-Siedel, Newton-Raphson, and Fast Decoupled load flow analysis methods and their application to the solution of complex networks will be introduced. Economic operation of power systems is to be covered. The planning, design and operation of electrical energy transmission and distribution networks will be examined. The subject aims to cover the electrical insulation properties and characteristics, insulator selection, insulation co-ordination in electric energy networks. Specifically sources of overvoltages, lightning impact on transmission and distribution networks, surge propagation theory, circuit interruption theory and circuit breaker operation are also covered in great length. The course also considers breakdown in gases, liquids and solids.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply techniques of load flow solutions including calculations of voltage, angles, losses, generated reactive power, slack power, etc.; 2. Model accurately a multi-bus system and carry out load flow studies; 3. Identify solutions to power system problems; 4. Display an understanding of circuit breaker operation; 5. Analyse electrical insulation properties and characteristics, insulator selection, insulation co-ordination in electric energy networks; 6. Study impact of overvoltages, lightning impact on transmission and distribution networks, surge propagation theory, circuit interruption theory and circuit breaker operation are also covered in great length; 7. Conduct experiments on breakdown in gases, liquids and solids.

Class Contact: Sixty (60) hours for one semester comprising of lectures, tutorials, and laboratory work.

Required Reading: Glover J.D., Sarma, M.S. and Overbye T.J./2012 5th ed. Power System Analysis and Design Cengage Learning

Assessment: Laboratory Work, Laboratory Reports (4 labs with 4 pages of report on each lab), 20%. Test, 2 Mid-semester tests (1 hour duration each), 20%. Examination, Final (3 hours closed book exam), 60%. Test assesses: Learning Outcomes 1-7 and Graduate Capabilities 1-6. Examination assesses: Learning Outcomes 1-7, and Graduate Capabilities 1-6. Laboratory Work assesses: Learning Outcomes 1-7, and Graduate Capabilities 1-6.

EPS4200 ELECTRIC ENERGY SYSTEMS PROTECTION AND COMMUNICATION

Locations: Footscray Park.

Prerequisites:ENE3201 - ELECTRICAL MACHINES AND CONTROL

Description: Protection: This subject covers the planning, design and operation of electrical protection systems for the generation, transmission and distribution systems of electric energy: planning, design standards and performance requirements; principles and types of protection systems (over-current, impedance, differential, backup, fuses); application of protection to generators, motors, transmission lines, transformers, busbars, and distribution; sources of overvoltage, lightning impact on transmission and distribution networks, surge propagation theory, circuit interruption theory; instrument transformers steady state and transient behaviour; electrical studies for planning and design of protection systems; power system communications for protection application. Power Electronics: Introduction to the theory, design and

analysis of conversion of electric power by means of power electronics, including AC to DC and DC to DC power converters. The fundamental knowledge of electronic speed control techniques for DC motor drives for different applications. AC-DC single-phase and three-phase power converters: Diode and SCR bridge rectifiers. DC-DC Switching Mode Power Converters, buck converters and boost converters, Buck-boost converters. Unipolar and bipolar voltage switching method. Flyback converters, push pull converters. First quadrant, two quadrant and four quadrant drive. Different electronic speed control techniques for DC motor drives.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify and apply different protection schemes applicable to generation, transmission and distribution systems;
- Design protection systems including relay settings and protection coordination;

3. Define the basics and operations of power semiconductor switches; 4. Describe the building blocks of power electronics conversion; 5. Analyse AC/DC and DC/DC power converters; 6. Analyse and design different types of switching power supplies in different modes of operation; 7. Demonstrate the knowledge of electronic speed control techniques for DC motor drives for different applications.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and laboratory work .
Required Reading: Lecture notes hand outs. Kalam, A. and Kothari, D.P., 2009, System Protection and Communications, New Age International (P) Ltd, N. Mohan, T. M. Undeland & W. P. Robbins, 2003, Power Electronics - Converters, Applications, and Design, John Wiley & Sons.
Assessment:A pass in each component of assessment is required for a subject pass. Examination, Final, 60%. Assignment, Assignment and Laboratory Exercises, 40%.

EPS4201 ELECTRIC ENERGY SYSTEMS PROTECTION AND POWER ELECTRONICS

Locations: Footscray Park.
Prerequisites: Nil.
Description: Protection: This unit covers the planning, design and operation of electrical protection systems for the generation, transmission and distribution systems of electric energy: planning, design standards and performance requirements; principles and types of protection systems (over-current, impedance, differential, backup, fuses); application of protection to generators, motors, transmission lines, transformers, busbars, and distribution; sources of overvoltage, lightning impact on transmission and distribution networks, surge propagation theory, circuit interruption theory; instrument transformers steady state and transient behaviour; electrical studies for planning and design of protection systems; power system communications for protection application. Power Electronics: Introduction to the theory, design and analysis of conversion of electric power by means of power electronics, including AC to DC and DC to DC power converters. The fundamental knowledge of electronic speed control techniques for DC motor drives for different applications. AC-DC single-phase and three-phase power converters: Diode and SCR bridge rectifiers. DC-DC Switching Mode Power Converters, buck converters and boost converters, Buck-boost converters. Unipolar and bipolar voltage switching method. Flyback converters, push pull converters. First quadrant, two quadrant and four quadrant drive. Different electronic speed control techniques for DC motor drives.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify and apply different protection schemes applicable to generation, transmission and distribution systems;
- Design protection systems including relay settings and protection coordination;
- Evaluate and assess recent innovations on power system communications;
- Summarise the new IEC61850 protocols;
- Define the basics and operations of power semiconductor switches;
- Describe the building blocks of power electronics conversion;
- Analyse AC/DC and DC/DC power converters;
- Study and design different types of switching power supplies in different modes of operation;
- Demonstrate the knowledge of electronic speed control techniques for DC motor drives for different applications.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and laboratory work .
Required Reading: Lecture notes hand outs. Kalam, A. and Kothari, D.P., 2010, 1st System Protection and Communications, New Age International (P) Ltd, N. Mohan, T. M. Undeland & W. P. Robbins, 2003, 1st Power Electronics - Converters, Applications, and Design, John Wiley & Sons.
Assessment:A pass in each component of assessment is required for a subject pass. Test, Mid-semester (2 test of 1 hour duration), 20%. Laboratory Work, Laboratory exercise (4 labs with 4 pages of report on each lab), 20%. Examination, Final (3 hours closed book), 60%. Test assesses: Learning Outcomes 1-9 and Graduate Capabilities 1-6. Examination assesses: Learning Outcomes 1-9, and Graduate Capabilities 1-6. Laboratory Work assesses: Learning Outcomes 1-9, and Graduate Capabilities 1-6. .

FDFCORHS3A MONITOR THE IMPLEMENTATION OF OCCUPATIONAL HEALTH AND SAFETY POLICIES AND PROCEDURES

Prerequisites: Nil.
Description: Ensure others in the work area are able to implement safe work practices;Monitor observance of safe work practices in the work area;Implement emergency procedures to respond to a hazardous event;Maintain and improve health and safety in the work area.
Required Reading:-
Assessment: As per accredited curriculum

FDFCORQFS3A MONITOR THE IMPLEMENTATION OF QUALITY AND FOOD SAFETY PROGRAMS

Prerequisites: Nil.
Description: Monitor quality of work outcome; Participate in maintaining and improving quality at work.
Required Reading:-
Assessment: As per accredited curriculum

FDFDPCC2B OPERATE A CURD PRODUCTION AND CUTTING PROCESS

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required to set up, operate, adjust and shut down a curd production and cutting process in cheese making.

Required Reading: Workbooks provided by School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test; workplace assessment; practical/exercises; assignments; verbal assessment.

FDFDPCM2B OPERATE A CHEESE PRESSING AND MOULDING PROCESS

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required to set up, operate, adjust and shut down a pressing and moulding process to produce cheese to specifications.

Required Reading: Workbooks provided by School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test; workplace assessment; practical/exercises; assignments; verbal assessment.

FDFDPFP2B OPERATE A FERMENTATION PROCESS

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required to set up, operate, adjust and shut down a fermentation process typically used in the production of dairy products.

Required Reading: Workbooks provided by School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; workplace assessment; practical/exercises; practical projects; assignments; verbal assessment.

FDFDPHS2B OPERATE A HOLDING AND STORAGE PROCESS

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required to set up, operate, adjust and shut down a holding/storage process under conditions that control the quality of the product. This process may apply to raw milk and/or processed products.

Required Reading: Workbooks provided by the School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test; workplace assessment; practical/exercises; assignments.

FDFOPTMR1A MEASURE AND RECORD WORKPLACE INFORMATION

Prerequisites: Nil.

Description: This is an Optional unit. It covers the skills and knowledge required to use basic measuring equipment and devices, read and record results. This unit is appropriate where simple tests involve automated measuring devices.

FDFOPTPIP3A PARTICIPATE IN IMPROVEMENT PROCESSES

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: It applies where the operator is required to participate in performance improvement processes that involve systematic analysis of performance to identify and propose opportunities for improvement. Where structured analysis and investigation is not required to participate in improvement programs, this unit does not apply.

Required Reading: Workbook provided by School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test; workplace assessment; practical/exercises; assignments;verbal assessment.

FDFPBBDM3A OPERATE A DOUGH MIXING PROCESS

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required to set up, operate, adjust and shut down the process used to make up dough. This includes selecting and mixing dough ingredients.

FDFRBAB3A PRODUCE ARTISAN BREADS

Prerequisites: Nil.

Description: This is a Specialist unit developed for the retail baking sector. It covers the skills and knowledge required to plan and produce a range of artisan breads. This includes flat breads, national and regional breads.

FDFRBBB2B MAKE BREAD

Prerequisites: Nil.

Description: This is a Specialist unit developed for the retail baking sector. It covers the principles, equipment and procedures used to bake bread in an in-store bakery or retail baking environment.

FDFRBDPB3B DIAGNOSE AND RESPOND TO PRODUCT AND PROCESS FAULT (BREAD)

Prerequisites: Nil.

Description: This is a Specialist unit. It builds on the problem solving skills developed in operational units and provides technical competencies to support problem solving relating to bread production. Identify causes of unacceptable product quality. Take corrective action according to workplace procedures.

FDFRBFM2B CONDUCT FINAL MOULD AND FINAL PROOF

Prerequisites: Nil.

Description: This is a Specialist unit developed for the retail baking sector. It covers the principles, equipment and procedures used to mould dough to final shape, place dough in tins or on baking surfaces and conduct final proof in an in-store bakery or retail baking environment.

FDFRBPD2B PRODUCE BREAD DOUGH

Prerequisites: Nil.

Description: This is a Specialist unit developed for the retail baking sector. It covers the principles, equipment and procedures used to produce a range of dough types including white, brown, wholemeal and grain doughs in an in-store bakery or retail baking environment.

FDFRBRD2B RETARD DOUGH

Prerequisites: Nil.

Description: This is a Specialist unit developed for the retail baking sector. It covers the principles, equipment and procedures used to retard and recover dough and other yeast-raised products in an in-store bakery or retail baking environment.

FDFRBSM2B SCALE AND MOULD DOUGH FOR INTERMEDIATE PROOF

Prerequisites: Nil.

Description: This is a Specialist unit developed for the retail baking sector. It covers the principles, equipment and procedures used to divide and shape dough in an in-store bakery or retail baking environment. It includes an intermediate proof stage.

FDFZCSCS2A CLEAN AND SANITIZE EQUIPMENT

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the purpose and effect of cleaning and sanitation and related procedures. This unit does not cover CIP (cleaning in place) processes. Where this is a required competency, select FDFZCSCIP2A Clean equipment in place. Basic cleaning and sanitation procedures are covered in operational units. This unit should be selected where the operator is primarily responsible for cleaning and/or where they require a more detailed knowledge of cleaning and sanitation processes to carry out cleaning responsibilities. This unit applies to both wet and dry cleaning methods.

FDFZPKPM1A PACK PRODUCT MANUALLY

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required to pack product manually. Packing may be into primary or secondary (inner or outer) packaging.

Required Reading: Workbooks provided by School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test; workplace assessment; practical/exercises; assignments; verbal assessment.

FDFZPMMB2A OPERATE A MIXING/BLENDING PROCESS

Locations: Industry.

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required to combine ingredients and additives in the correct quantities and sequence and to operate and shut down mixing and blending equipment to achieve the required mix characteristics. Mixes may include concentrated pre-mixes or bulk blends. The output of this process may be a product requiring further processing or for external use. This unit is appropriate to select where the mixing/blending process is a stand-alone process and involves an understanding of addition method and sequence. Where mixing is an in-line component of a larger process, this unit is not appropriate. Where the mixing process does not require a detailed understanding of sequencing or ingredient characteristics, the unit FDFZPMBM1A Prepare basic mixes may be more appropriate.

Required Reading: No required text

Assessment: Observation, demonstration, case studies, scenarios and projects.

FDFZPRDTP2A OPERATE A DEPOSITING PROCESS

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required setup, operate, adjust and shut down a depositing process to deposit into tins, onto belts or directly onto product, where a further processing outcome is required.

Required Reading: Workbooks provided by School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test; on job or workplace assessment; practical/exercises; assignments; verbal assessment.

FDFZPRIPK3A APPLY RAW MATERIALS/ INGREDIENT AND PROCESS KNOWLEDGE

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This is a Specialist unit. It covers skills and knowledge required to apply knowledge of ingredients and processes to troubleshoot typical problems that occur in preparing, processing and/or packaging product. This unit applies where problem solving occurs over one or more processes and requires an understanding of the characteristics of raw materials/ingredients and processing methods used.

Required Reading: Workbooks provided by School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; workplace assessment; practical/exercises; assignments; verbal assessment.

FDFZPRSYS3A OPERATE PROCESSES IN A PRODUCTION SYSTEM

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: FDFZPMMB2A - OPERATE A MIXING/BLENDING PROCESSFDFZPRDTP2A - OPERATE A DEPOSITING PROCESS

Description: This is a Specialist unit. It covers the skills and knowledge required to set up, operate and adjust inter-related processes in a production system. A system typically involves a series of inter-related processes that must be co-ordinated and concurrently operated to produce the required outcome. Individual processes may be directly operated, automated and/or operated by others.

Required Reading: Workbooks provided by School of Sport and Science

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test; on job or workplace assessment; practical/exercises; practical projects; assignments; verbal assessment.

FDFZPRW1A PARTICIPATE EFFECTIVELY IN A WORKPLACE ENVIRONMENT

Prerequisites: Nil.

Description: This is a Specialist unit. It covers the skills and knowledge required to participate effectively in a workplace environment.

HAP6901 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field

- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs

autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HAP6902 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HAP6911 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HAP6912 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HCP6901 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of

international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, ResearchThesis, Pass/Fail.

HCP6902 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, ResearchThesis, Pass/Fail.

HCP6911 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, ResearchThesis, Pass/Fail.

HCP6912 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisor.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, ResearchThesis, Pass/Fail.

HEP6901 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HEP6902 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HEP6911 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HEP6912 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HES0001 DIRECTED STUDIES 1A

Locations: All campuses of the university where appropriate physical resources are available.

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description:A selection of topics from the discipline areas encompassed by the College of Engineering and Science equivalent to a other first year, 12 credit point subjects in those discipline areas offered by the College.

Credit Points:12

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 12 credit point, first year units of study offered by the Faculty of Health, Engineering and Science.

Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other first year, 12 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0002 DIRECTED STUDIES 1B

Locations:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other first year, 12 credit point units of study offered by the College of Engineering and Science..

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description:A selection of topics from the discipline areas encompassed by the College of Engineering and Science equivalent to a other first year, 12 credit point subjects in those discipline areas offered by the College.

Credit Points:12

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 12 credit point, first year units of study offered by the Faculty of Health, Engineering and Science.

Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other first year, 12 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0003 DIRECTED STUDIES 1C

Locations: All campuses of the university where appropriate physical resources are available.
Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled
Description:A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other first year, 6 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.
Credit Points:6

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.
Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 6 credit point, first year units of study offered by the Faculty of Health, Engineering and Science.
Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other first year, 6 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0004 DIRECTED STUDIES 1D

Locations: All campuses of the university where appropriate physical resources are available.
Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled
Description:A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other first year, 6 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.
Credit Points:6

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.
Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 6 credit point, first year units of study offered by the Faculty of Health, Engineering and Science.
Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other first year, 6 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0005 DIRECTED STUDIES 2A

Locations: All campuses of the university where appropriate physical resources are available.
Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled
Description:A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other second year, 12 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.
Credit Points:12

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.
Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 12 credit point, second year units of study offered by the Faculty of Health, Engineering and Science.
Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other second year, 12 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0006 DIRECTED STUDIES 2B

Locations: All campuses of the university where appropriate physical resources are available.

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description: A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other second year, 12 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.

Credit Points: 12

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 12 credit point, second year units of study offered by the Faculty of Health, Engineering and Science.

Assessment: A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other second year, 12 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0007 DIRECTED STUDIES 2C

Locations: All campuses of the university where appropriate physical resources are available.

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description: A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other second year, 6 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.

Credit Points: 6

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 6 credit point, second year units of study offered by the Faculty of Health, Engineering and Science.

Assessment: A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other second year, 6 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0008 DIRECTED STUDIES 2D

Locations: All campuses of the university where appropriate physical resources are available.

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description: A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other second year, 6 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.

Credit Points: 6

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 6 credit point, second year units of study offered by the Faculty of Health, Engineering and Science.

Assessment: A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other second year, 6 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0009 DIRECTED STUDIES 3A

Locations: All campuses of the university where appropriate physical resources are available.

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description:A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other third year, 12 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.

Credit Points:12

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 12 credit point, third year units of study offered by the Faculty of Health, Engineering and Science.

Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other third year, 12 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0010 DIRECTED STUDIES 3B

Locations: All campuses of the university where appropriate physical resources are available.

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description:A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other third year, 12 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.

Credit Points:12

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 12 credit point, third year units of study offered by the Faculty of Health, Engineering and Science.

Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other third year, 12 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0011 DIRECTED STUDIES 3C

Locations: All campuses of the university where appropriate physical resources are available.

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description:A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other third year, 6 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.

Credit Points:6

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 6 credit point, third year units of study offered by the Faculty of Health, Engineering and Science.

Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other third year, 6 credit point units of study offered by the Faculty of Health, Engineering and Science.

HES0012 DIRECTED STUDIES 3D

Locations: All campuses of the university where appropriate physical resources are available.

Prerequisites: Satisfactory completion of appropriate prerequisite studies as determined by the course coordinator in which a student, or group of similar students, seeking to undertake this unit is enrolled

Description:A selection of topics from the discipline areas encompassed by the Faculty of Health, Engineering and Science equivalent to a other third year, 6 credit point subjects in those discipline areas offered by the Faculty of Health, Engineering and Science.

Credit Points:6

Learning Outcomes: Upon completion of this unit, students will be able:

- to identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study
- to locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to
- reach a solution to the problem posed.

Class Contact: Depending on the nature of the content areas to be covered it is anticipated that between 48 and 60 hours per semester of lecture/tutorial/seminar/laboratory sessions will be required.

Required Reading: The content of this unit of study will vary according to the specific needs of the students undertaking it the required reading will depend on the content area of the studies undertaken. The required reading will, in general, be the same as or similar to that for other, 6 credit point, third year units of study offered by the Faculty of Health, Engineering and Science.

Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for other third year, 6 credit point units of study offered by the Faculty of Health, Engineering and Science.

HGP6901 RESEARCH THESIS (FULL TIME)

Locations: St Albans.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HGP6902 RESEARCH THESIS (FULL TIME)

Locations: St Albans.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HGP6911 RESEARCH THESIS (PART TIME)

Locations: St Albans.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HGP6912 RESEARCH THESIS (PART TIME)

Locations: St Albans.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HIP6901 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis

format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HIP6902 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HIP6911 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral

Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HIP6912 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HLP6901 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs

autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HLP6902 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs

autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HLP6911 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs

autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HLP6912 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning

- ethical practice and full responsibility and accountability for personal outputs

autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisor.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HMP6901 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points: 48
Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar
Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HMP6902 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points: 48
Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar
Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HMP6911 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes

below.
Credit Points:24
Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar
Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HMP6912 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:24
Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar
Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HOP6901 RESEARCH THESIS (FULL TIME)

Locations: Werribee.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:48
Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations

and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HOP6902 RESEARCH THESIS (FULL TIME)

Locations: Werribee.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HOP6911 RESEARCH THESIS (PART TIME)

Locations: Werribee.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HOP6912 RESEARCH THESIS (PART TIME)

Locations: Werribee.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HPP6901 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HPP6902 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field

- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HPP6911 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HPP6912 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of:

- expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field
- intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem
- expert cognitive, technical and creative skills to:
- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature
- expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations.
- capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals.
- intellectual independence, initiative and creativity in new situations and/or for further learning
- ethical practice and full responsibility and accountability for personal outputs
- autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HSL4121 BULK FREIGHT SYSTEMS STRUCTURE, DYNAMICS AND PERFORMANCE

Locations: This unit will be delivered directly into BHP and/or other companies..
Prerequisites: Nil.
Description: This unit provides an introduction of the fundamental axioms and operating concepts necessary to understand complex systems. It examines competitive market environments and focuses on creating efficient supply and value-driven chains.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:-

- Demonstrate a broad knowledge of the scope of the supply chain in bulk freight management systems and apply these to a broad range of industry scenarios.
- Analyse supply chain structures and the underlying dynamics of chains and communicate findings and recommendations for strategy deployment in both oral and written forms. As a team member identify, assess, and employ key processes and frameworks that are significant in the development of supply chains in bulk freight markets.
- Determine the significance of modal integration and the difference between supply and value chains.
- Produce a group syndicate report that outlines and critically analyses concepts, principles and terminology associated with effective governance of bulk freight systems.
- Investigate how firms, domestic and global, capture competitive advantage and value in bulk freight markets
- Critically analyse the notions of competition and competitive markets.
- Independently design, develop and implement a research project that takes into consideration notions of competition and competitive markets; competitive advantage and value in bulk freight chains; intercultural and international contexts; and social and environmental sustainability.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, seminars and self directed learning. Hours per week for this unit: Equivalent to 4 hours per week, delivered in burst mode
Required Reading: Ross Robinson (2009), Chain Systems Analysis: NewThinking about Supply Chain Efficiency Monograph 1 in Monograph Series in Chain Systems Analysis. The Centre for Integrated Freight Systems Management,The University of Melbourne, January. Sophia Everett (2009), Chain Systems Analysis: Transport Policy in Australia Monograph 2 in Monograph Series in Chain Systems Analysis. The Centre for Integrated Freight Systems Management, The University of Melbourne, January. P. Evangelista, A. McKinnon, E. Sweeney and E. Esposito (2012), Supply Chain Innovation for Competing in Highly Dynamic Markets: Challenges and Solutions. Business Science Reference, USA.
Assessment: Presentation, Group Seminar Presentation (30 - 45 minutes dependent on group size) , 10%. Project, Group Syndicate Project Report in a format appropriate for business briefing to the Executive (2000 words), 40%. Report, Individual Research Report (3000 words), 50%. Group Seminar Presentation assesses: Learning Outcomes: 1, 2 and 3 and Graduate Capabilities: 1 and 3 Group Syndicate Project assesses: Learning Outcomes: 1, 2, 3, 4 and 5 and Graduate Capabilities: 3 and 5. LiWC is linked to the Group Syndicate Project. Research Report assesses: Learning Outcomes: 1, 5, 6 and 7 and Graduate Capabilities: 3, 4 and 5 .

HSL4122 STRATEGIES FOR BULK FREIGHT SYSTEMS

Locations: This unit will be delivered directly into BHP and/or other companies..
Prerequisites: Nil.
Description: This unit poses the question of future development for firms and authorities in the bulk freight sector; and examines issues of infrastructure investment, development planning and forward programming.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- As a small team member critically analyse and review the fundamental differences between strategy and planning and apply these to a broad range of scenarios
- Analyse bulk freight supply chains and the underlying impacts of changing paradigms and the reasoning behind paradigm shifts by communicating and undergoing a peer review of these findings in both oral and written forms
- As a team member identify, assess and employ key processes and frameworks that are significant in understanding and differentiating between shorter run and longer term investment efficiency in chains
- Determine the significance of strategy and planning on value and supply chains
- Investigate key principles of investment – when to invest, how much, by whom over what time period and at what price
- Critically analyse strategic investment as it relates to bulk freight supply chains
- Strategically analyse an issue taking into consideration the notions of strategy and planning; changing paradigms; the reasoning behind paradigm shifts; key principles of investment; strategic investment; intercultural and international contexts; and social and environmental sustainability

Class Contact: Forty-eight (48) hours for one semester comprising lectures, seminars and self directed learning. Hours per week: equivalent to 4 hours per week, delivered in burst mode.

Required Reading: Ross Robinson (2009), Chain Systems Analysis: NewThinking about Supply Chain Efficiency Monograph 1 in Monograph Series in Chain Systems Analysis. The Centre for Integrated Freight Systems Management,The University of Melbourne, January. Sophia Everett (2009), Chain Systems Analysis: Transport Policy in Australia Monograph 2 in Monograph Series in Chain Systems Analysis. The Centre for Integrated Freight Systems Management, The University of Melbourne, January. P. Evangelista, A. McKinnon, E. Sweeney and E. Esposito (2012), Supply Chain Innovation for Competing in Highly Dynamic Markets: Challenges and Solutions. Business Science Reference, USA.

Assessment: Details of Assessment Concept Review and Analysis Session: Students will be required to participate in a group thinking exercise session, present thinking and undertake a peer review of the presentations. Group Syndicate Project: Students will be required to complete a syndicate project report (2000 words) in a format appropriate for business briefing to the Executive. Individual Strategic Analysis Report: Students will be required to complete a strategic analysis report (3000 words) on either an assigned or significant work related issue. Review, Concept Review and Analysis Session, 10%. Project, Group Syndicate Project Report (2000 words), 40%. Report, Individual Strategic Analysis Report (3000 words), 50%. Concept Review and Analysis Session assesses: Learning Outcomes: 1, 2 and 3 and Graduate Capabilities: 1, 2 and 6. Group Syndicate Project assesses: Learning Outcomes: 1, 2, 3, 4 and 5 and Graduate Capabilities: 1, 2 and 4. LiWC is linked to the Syndicate Project. Individual Strategic Analysis Report assesses: Learning Outcomes: 1, 5, 6 and 7 and Graduate Capabilities: 1, 2 and 4. .

HSL4123 MANAGING BULK FREIGHT SYSTEMS

Locations: This unit will be delivered directly into BHP and/or other companies..

Prerequisites: Nil.

Description: This unit focuses on developing the skills to effectively manage complex chains; taking delays out of systems; queuing; cost; pricing; and information systems.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:- Demonstrate a knowledge of a changing market structure and the skills required to operate successfully in a changing domestic and global market. Analyse changing ownership structure, organisational structures and the impact of these on third party service providers and communicate findings and recommendations for strategy deployment in both oral and written forms. As a team member identify, differentiate between, assess and employ the concepts of efficiency and effectiveness within bulk freight chains. Determine the significance and nature of competition and competitive efficiency. Produce a business case report that outlines and critically analyses the concepts, principles and significance of integrative efficiency on a selected business issue. Investigate the cost imposts of congestion points and disintegrative freight networks. Provide managers and specialists with the background, analytical skills and techniques necessary to manage complex bulk freight systems efficiently and effectively. Independently design, develop and implement a research project that takes into consideration the notion of variability; measures of variability; cost imposts of congestion points and disintegrative networks; competitive and integrative efficiency; changing market structures; intercultural and international contexts; and social and environmental sustainability. Reflect on the knowledge and skills necessary for a range of careers option in the logistics and supply chain field and assess own learning in relation to these.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, seminars and self directed learning. Hours per week for this unit: Equivalent to 4 hours per week, delivered in burst mode.

Required Reading: Ross Robinson (2009), Chain Systems Analysis: NewThinking about Supply Chain Efficiency Monograph 1 in Monograph Series in Chain Systems Analysis. The Centre for Integrated Freight Systems Management, The University of Melbourne, January. Sophia Everett (2009), Chain Systems Analysis: Transport Policy in Australia Monograph 2 in Monograph Series in Chain Systems Analysis. The Centre for Integrated Freight Systems Management, The University of Melbourne, January. P. Evangelista, A. McKinnon, E. Sweeney and E. Esposito (2012), Supply Chain Innovation for Competing in Highly Dynamic Markets: Challenges and Solutions. Business Science Reference, USA.

Assessment: Details of Assessment: Concept Review and Analysis Session: Students will be required to participate in a reflective thinking exercise either in small groups or pairs and share these thoughts with their peers. Business Case Report: Students will be required to prepare a group business case report (2000 words) in a format appropriate for business briefing to the Executive or to other key stakeholders on a domestic or global issue impacting on bulk freight supply chain integration Review, Concept Review and Analysis Session (45 - 60 Minutes), 10%. Report, Business Case Report (2000 words), 40%. Report, Individual Research Report (3000 words), 50%. Concept Review and Analysis Session assesses: Learning Outcomes: 1, 3 and 8 and Graduate Capabilities: 1 and 3 Business Case Report assesses: Learning Outcomes: 1, 2, 3, 4 and 5 and Graduate Capabilities: 2 and 3. LiWC is linked to the Business Case Report. Individual Research Report assesses: Learning Outcomes: 5, 6, 7 and 8 and Graduate Capabilities: 1, 2 and 3 .

HSL4124 POLICY AND CHAIN EFFICIENCY FUNDAMENTAL PRINCIPLES

Locations: This unit will be delivered directly into BHP and/or other companies..

Prerequisites: Nil.

Description: This unit investigates the impact of policy, including regulatory and statutory policy, on chain efficiency. It will focus not only on policy content but on the process of policy-making by addressing issues relating to National Competition

Policy and trade practices legislation.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Demonstrate a knowledge of the fundamental nature and structure of the policy process and apply this to a broad range of industry scenarios, both national and international.
- Through the use of case study critically analyse policy content and policy process, differentiate between them and communicate findings and recommendations for deployment in both oral and written forms.
- As a team member identify, assess impact of and employ the mechanisms of policy-making on supply chains in bulk freight markets.
- Determine the significance of microeconomic reform on supply chains in bulk freight markets.
- As part of a team outline, critically analyse and debate concepts, principles and terminology associated with the nature and rationale for National Competition Policy.
- Critically analyse Part 111A of the Trade Practices legislation and third party access regimes on their impact on supply chains within bulk freight markets.
- Critically analyse the changing notions in modal policies in ports, Australian shipping, rail and trucking.
- Complete a research paper that investigates and takes account of notions of modal policy; National Competition Policy; the impacts of Part111A of Trade Practices Legislation; third party access regimes; intercultural and international contexts; and social and environmental sustainability on bulk freight supply chains.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, seminars and self directed learning. Hours per week for this unit: Equivalent to 4 hours per week, delivered in burst mode.
Required Reading: Ross Robinson (2009), Chain Systems Analysis: NewThinking about Supply Chain Efficiency Monograph 1 in Monograph Series in Chain Systems Analysis, The Centre for Integrated Freight Systems Management, The University of Melbourne, January. Sophia Everett (2009), Chain Systems Analysis: Transport Policy in Australia Monograph 2 in Monograph Series in Chain Systems Analysis. The Centre for Integrated Freight Systems Management, The University of Melbourne, January. P. Evangelista, A. McKinnon, E. Sweeney and E. Esposito (2012), Supply Chain Innovation for Competing in Highly Dynamic Markets: Challenges and Solutions. Business Science Reference, USA.
Assessment: Case Study Analysis: Students will be required to present (45 - 60 minutes dependent on group size) a summary of findings and recommendations for an assigned case study. Policy Debate: Students will be empanelled in teams to participate in a policy debate on a selected topical issue. Individual Research Paper: Students will be required to complete a research paper (3000 words) on an agreed area of policy significance. Case Study, Case Study Analysis (45 - 60 minutes), 20%. Presentation, Policy Debate, 30%. Research Paper, Individual Research Paper (3000 words), 50%. Case Study Analysis assesses: Learning Outcomes: 1, 2 and 3 and Graduate Capabilities: 1, 4 and 6. LIWC is linked to the Case Study Analysis. Policy Debate assesses: Learning Outcomes: 1, 2, 3, 4 and 5 and Graduate Capabilities: 4, 5, and 6. LiWC is linked to the Policy Debate. Individual Research Paper assesses: Learning Outcomes: 5, 6 and 7 and Graduate Capabilities: 2, 3, 5 and 6 .

HSP6901 RESEARCH THESIS (FULL TIME)

Locations: Werribee.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:48
Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar
Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HSP6902 RESEARCH THESIS (FULL TIME)

Locations: Werribee.
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis

format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The students will need to demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit would be assessed by the supervisory team, and by the Faculty Postgraduate Research Committee through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HSP6911 RESEARCH THESIS (PART TIME)

Locations: Werribee.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HSP6912 RESEARCH THESIS (PART TIME)

Locations: Werribee.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HTP6901 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HTP6902 RESEARCH THESIS (FULL TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:48

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HTP6911 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis

format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors.

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

HTP6912 RESEARCH THESIS (PART TIME)

Locations: Footscray Park.

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem expert cognitive, technical and creative skills to: design, develop and implement a research project/s to systematically investigate a research problem develop, adapt and implement research methodologies to extend and redefine existing knowledge manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. intellectual independence, initiative and creativity in new situations and/or for further learning ethical practice and full responsibility and accountability for personal outputs autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar

Required Reading: To be determined in consultation with the supervisors

Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the School and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

ICAA5044B DESIGN PLAN

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to specify the hardware, network, software and infrastructure required to support the system.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA5045B PRODUCE NETWORK ARCHITECTURE DESIGN

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to specify the design of the required network architecture.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA5054C VALIDATE QUALITY AND COMPLETENESS OF SYSTEM DESIGN SPECIFICATIONS

Locations: Werribee, Footscray Park, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to check the system specifications against outcomes and quality standards. System quality may refer to the network system, a program or a project.

Required Reading: Microsoft Official Course 2009 6425A Configuring and troubleshooting Windows Server 2008 Micosoft Press Microsoft Official Course 2009 6430A Planning and Administering Windows Server2008 Micosoft Press Microsoft Official Course 2009 6420A Fundamentals of Windows Server 2008 Network and

Applications Infrastructure Micosoft Press Mark Ciampa 2009 CWSP Guide to Wireless Security Thomson Course Technology Mark Ciampa 2009 Security+ guide to Network Security Thomson Course Technology

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA5056B PREPARE DISASTER RECOVERY AND CONTINGENCY PLANS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to analyse the impact of the system on the organisation and carry out risk analysis, disaster recovery and contingency planning for the project.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA5141B DESIGN DYNAMIC WEBSITES TO MEET TECHNICAL REQUIREMENTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to produce a plan that analyses specified technical requirements and then designs, builds and tests a dynamic website so that it meets those technical requirements.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA5145B IDENTIFY BEST-FIT TOPOLOGY FOR A WIDE AREA NETWORK

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to identify the best way computers and local area networks (LANs) can be connected to make a wide area network (WAN).

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA5151B GATHER DATA TO IDENTIFY BUSINESS REQUIREMENTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to identify, analyse and document business requirements.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA5158B TRANSLATE BUSINESS NEEDS INTO TECHNICAL REQUIREMENTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to identify the needs of a business or business process and quantify those needs into technical requirements that will enable the business or process to meet expectation.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA6052B DESIGN AN IT SECURITY FRAMEWORK

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to evaluate IT security requirements for a new system and to plan for controls and contingencies.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAA6053B DESIGN SYSTEM SECURITY AND CONTROLS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to design the controls that ensure the organisational system is secure from both a legal and business perspective.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB4136A USE STRUCTURED QUERY LANGUAGE TO CREATE DATABASE STRUCTURES AND MANIPULATE DATA

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to use a structured query language (SQL) to define, create and manipulate database structures and associated data in a relational database.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB4169B USE DEVELOPMENT SOFTWARE AND IT TOOLS TO BUILD A BASIC WEBSITE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to build a basic website that is consistent with design and technical requirements, and business expectations.

Required Reading: No required text

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments. 22051VIC Diploma of Business (Public Relations) Assessment method will include skills test and practical applications.

ICAB5068B BUILD USING RAPID APPLICATION DEVELOPMENT

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.
Description: This unit defines the competency required to build using rapid application development (RAD) tools.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5159B BUILD A SECURITY SHIELD FOR A NETWORK

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to build a security shield for a wireless local area network (WLAN) or local area network (LAN).
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5160B BUILD AND CONFIGURE A SERVER

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to build, configure and test a server.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5223B APPLY INTERMEDIATE OBJECT-ORIENTED LANGUAGE SKILLS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to undertake intermediate-level programming tasks using an object-oriented programming language
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5226B APPLY ADVANCED OBJECT-ORIENTED LANGUAGE SKILLS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to undertake advanced programming tasks using an object-oriented programming language.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5227B APPLY ADVANCED PROGRAMMING SKILLS IN ANOTHER LANGUAGE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to undertake advanced programming tasks using a selected choice of another programming language. The second language may be an object-oriented language.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5228B MAINTAIN FUNCTIONALITY OF LEGACY CODE PROGRAMS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to maintain the functionality of legacy code programs.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5230B MAINTAIN CUSTOM SOFTWARE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to maintain software so that it continues to meet client user requirements.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5237B BUILD A HIGH PERFORMANCE SECURITY PERIMETER

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to build high-level security and network functionality into a network by configuring a firewall appropriately.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAB5238B BUILD A HIGHLY SECURE FIREWALL

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to build high performance failure resistant security perimeters.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAD4209B WRITE CONTENT FOR WEB PAGES

Locations: Industry, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to write concise, clear and relevant content for web pages on behalf of a client. The following units are linked and form an appropriate cluster: ICAA4142C Design a website to meet technical requirements ICAW4027B Relate to clients on a business level ICAI4189B Ensure website content meets technical protocols and standards ICAT4194B Ensure basic website security ICAT4195B Ensure dynamic website security No licensing, legislative, regulatory or certification requirements apply to this unit at the time of

publication.

Required Reading: No required text

Assessment: Assessment may include: assignments; classwork; projects; case studies; presentations; demonstration and observation.

ICADBS403A CREATE BASIC DATABASES

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to design a database to meet a specification.

Required Reading: No text required.

Assessment: Evidence of the ability to: - research client requirements for a database solution - design a database that meets client requirements - create a database on a web hosting service to meet client requirements by a due date.

ICADBS502A DESIGN A DATABASE

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to establish client needs and technical requirements and to design a database that meets those requirements.

Required Reading: No required text

Assessment: Evidence of the ability to: -design a well-structured database that represents the client's business reality and provides the user with a productive business tool.

ICADBS504A INTEGRATE DATABASE WITH A WEBSITE

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to ensure database is integrated with a website.

Required Reading: No required text

Assessment: Evidence of the ability to: -create a web application which accesses a database, displaying and modifying the database data provided by user input.

ICAI3101A INSTALL AND MANAGE A NETWORK

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit applies to all contexts for indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. This unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs, and multi media. This unit may be applied to domestic, commercial or industrial installations.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAI4097A INSTALL AND CONFIGURE A NETWORK

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to plan and carry out the installation or network hardware and software and initial configuration according to organisational guidelines.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAI5098B INSTALL AND MANAGE COMPLEX NETWORKS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to ensure that the system is operational prior to hand over for client use.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAI5100B BUILD AN INTERNET INFRASTRUCTURE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to design and implement an infrastructure for internet services.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAI5152B IMPLEMENT RISK MANAGEMENT PROCESSES

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to implement procedures that identify, analyse, evaluate and monitor risks involving ICT systems and technology. This includes the development and management of contingency plans.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAI5176B INSTALL AND CONFIGURE ROUTER

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to install and configure a router to a basic level.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAI5197B INSTALL AND MAINTAIN VALID AUTHENTICATION PROCESSES

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to develop, install and maintain an authentication processes.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAI6187B IMPLEMENT CHANGE MANAGEMENT PROCESSES

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: Plan IT system changes; Identify technology system change needs; Implement change; Monitor and review implementation.

Required Reading: -

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAICT101A OPERATE A PERSONAL COMPUTER

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to operate a personal computer (PC) in a home or small office environment. This entry level unit provides the learner with information technology (IT) literacy skills in setting up a personal computer, accessing files with application programs, sending and retrieving emails, using the internet, using peripheral devices, such as printers, scanners, webcams and data projectors, applying basic security procedures and power-management settings, and backing up and shutting down a personal computer.

Required Reading: No text required.

Assessment: Evidence of the ability to: - use hardware and software - navigate around the desktop - use system features to perform tasks - save results of work.

ICAICT102A OPERATE WORD-PROCESSING APPLICATIONS

Locations: Footscray Nicholson, Werribee, Industry, Melton, Sunshine, City Flinders, St Albans, 21933VIC Certificate III in ESL (Access): Footscray Nicholson, Melton, St Albans, Sunshine and Werribee Campuses..

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to operate word-processing applications and perform basic operations, including creating and formatting documents, creating tables and printing labels.

Required Reading: No text required. The teacher will provide teaching and learning material as required.

Assessment: Evidence of the ability to: - follow OHS requirements - create, open and retrieve documents - customise basic settings - format documents - create tables - add text, objects and images - save and print documents.

ICAICT105A OPERATE SPREADSHEET APPLICATIONS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to operate spreadsheet applications and perform basic operations, including creating and formatting spreadsheet data, incorporating charts and objects, and customising and printing spreadsheets.

Required Reading: No text required.

Assessment: Evidence of the ability to: - create spreadsheets - customise basic settings - format spreadsheets - create basic formulas - work with objects and charts in spreadsheets - save and print spreadsheets.

ICAICT106A OPERATE PRESENTATION PACKAGES

Locations: Footscray Nicholson, Werribee, Industry, Melton, Sunshine, City Flinders, Off-shore, St Albans, 21940VIC Certificate IV in ESL (Further Study) - Liaoning University (China), Off-shore, City Flinders, Footscray Nicholson, Melton, St Albans, Sunshine and Werribee Campuses..

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to operate presentation applications and perform basic operations, including creating, formatting and adding effects to presentations.

Required Reading: 21940VIC Certificate IV in ESL (Further Study): No required texts. The teacher will provide teaching and learning materials as required. Other Courses: No text required.

Assessment: A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: - verbal or written questioning to assess candidate's knowledge of presentation software functions - direct observation of candidate creating and formatting presentations - review of presentations, including formatting and slide show effects. 21940VIC Certificate IV in ESL (Further Study): Assessment may include: records of teacher's observations of students' activities; observation checklists; verbal questioning; a portfolio of work and other documents; interview or written test; self-assessment; practical tasks; samples of work and third-party feedback. ICA10111 Certificate I in Information, Digital Media and Technology: Evidence of the ability to: - create, format and prepare presentations for distribution and display - customise basic settings - add slide show effects.

ICAICT107A USE PERSONAL PRODUCTIVITY TOOLS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to use the features and components of a personal productivity tool, including personal digital assistants (PDAs) or computerised personal organisers.

Required Reading: No text required.

Assessment: Evidence of the ability to: - use the calendar of the personal productivity tool to schedule events and appointments - create, edit and delete contacts - use the additional features of a particular personal productivity tool.

ICAICT108A USE DIGITAL LITERACY SKILLS TO ACCESS THE INTERNET

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to safely and securely use the internet to undertake basic interactive communication. It involves a working knowledge of current industry standard technologies and the ability to apply these technologies to a number of digital literacy situations.

Required Reading: No text required.

Assessment: Evidence of the ability to: - connect to and access the internet - send and receive emails - secure internet access and email communications - use search tools to locate information or content - research and select appropriate websites - undertake online interactions - make an informed assessment of the accuracy, currency, authority and reliability of the site and information located.

ICAICT201A USE COMPUTER OPERATING SYSTEMS AND HARDWARE

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to select, configure and use computer operating systems and basic computer hardware.

Required Reading: No text required.

Assessment: Evidence of the ability to: - use an operating system in a variety of scenarios and across functions, including: - scheduling, loading, initiating, and supervising the execution of programs - allocating storage - initiating and controlling input and output operations - handling errors - identify and install suitable hardware components - install and upgrade application software.

ICAICT202A WORK AND COMMUNICATE EFFECTIVELY IN AN IT ENVIRONMENT

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to work and communicate effectively within organisational policies and governance arrangements using information technology (IT) systems, equipment and software.

Required Reading: No text required.

Assessment: Evidence of the ability to: - process internal and external requests according to organisational policies and requirements and - respond promptly to client enquiries and requests from colleagues.

ICAICT203A OPERATE APPLICATION SOFTWARE PACKAGES

Locations: Footscray Nicholson, Werribee, Industry, Melton, Footscray Park, Sunshine, St Albans, 21934VIC Certificate IV in ESL (Access): Footscray Nicholson, Melton, St Albans, Sunshine and Werribee Campuses..

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to identify, select and operate three commercial software packages, including a word-processing and a spreadsheet application package. This unit identifies the requirement to use a word-processing, spreadsheet and third software application package to ensure that the individual develops the skills required to cover a range of basic office software requirements.

Required Reading: No required text. The teacher will provide teaching and learning material as required.

Assessment: Evidence of the ability to: -produce workplace documents using a minimum of three different software application packages -open, amend and save files and documents according to organisational requirements -use OHS principles and responsibilities for ergonomics, such as work periods and breaks -use help manuals and online help. A range of assessment methods should be used to assess practical skills and knowledge. The following examples are appropriate for this unit: - verbal or written questioning to assess candidate's knowledge of internet access requirements, email features and search engine attributes - direct observation of candidate accessing the internet, using email, and searching and interacting with consumer sites using advanced search features - direct observation of candidate undertaking online interactions - review of search results, including assessment of the accuracy, currency and reliability of the site and information located. .

ICAICT210A OPERATE DATABASE APPLICATIONS

Locations: Footscray Nicholson, Industry, VETiS.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to operate database applications and perform basic operations.

Required Reading: No required text

Assessment: Evidence of the ability to: design and develop a simple database using a standard database packageadd datause queriescreate forms and reports.

ICAICT301A CREATE USER DOCUMENTATION

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to create user documentation that is clear to the target audience and easy to navigate.

Required Reading: No required text

Assessment: Evidence of the ability to create user documentation that: -meets business requirements -caters for a diverse readership -is clear to the target audience -is easy to navigate.

ICAICT302A INSTALL AND OPTIMISE OPERATING SYSTEM SOFTWARE

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit defines the performance outcomes, skills and knowledge required to install operating system (OS) software and to make adjustments as a means of optimising the system to accommodate business and client needs.

Required Reading: No required text

Assessment: Evidence of the ability to: -install, configure and test an operating system to improve system performance with minimum disruption to clients.

ICAICT303A CONNECT INTERNAL HARDWARE COMPONENTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to modify and connect system hardware components according to client and user requirements.

Required Reading: No required text

Assessment: Evidence of the ability to: -identify and categorise the different types of internal hardware components -modify system's hardware to meet client requirements -plan the modification and connect internal hardware components according to vendor and technical specifications -install components across a variety of situations and account for unexpected contingencies.

ICAICT304A IMPLEMENT SYSTEM SOFTWARE CHANGES

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to implement system software changes and to hand over the modified system to the client's operational area.

Required Reading: No required text

Assessment: Evidence of the ability to: -evaluate, document and implement changes to the system with minimum disruption to the system and client users.

ICAICT305A IDENTIFY AND USE CURRENT INDUSTRY-SPECIFIC TECHNOLOGIES

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to use specific industry technologies to meet identified industry standards. The unit emphasises the importance of constantly reviewing and demonstrating work processes, skills and techniques to ensure that the quality of the entire business process is maintained at the highest level possible through the appropriate application of industry-specific technologies.

Required Reading: No required text

Assessment: Evidence of the ability to: -identify new and emerging industry-specific technologies -use features and functions of identified industry-specific technologies to an industry standard level.

ICAICT306A MIGRATE TO NEW TECHNOLOGY

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to use upgraded technology. It includes testing and evaluating new technologies to improve the organisation's performance.

Required Reading: No required text

Assessment: Evidence of the ability to: -identify new and emerging technology in IT -conduct testing and evaluate new equipment for the benefit of the organisation -use features and functions of new technologies, including software and equipment.

ICAICT307A CUSTOMISE PACKAGED SOFTWARE APPLICATIONS FOR CLIENTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to analyse, design, implement and review the customisation of packaged software applications, using simple programming constructs.

Required Reading: No required text

Assessment: Evidence of the ability to: -identify and document client requirements to customise software applications -design software applications -analyse, implement and review customised software applications -produce documentation for client.

ICAICT308A USE ADVANCED FEATURES OF COMPUTER APPLICATIONS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to use computer applications employing advanced features. It involves manipulating data and accessing support resources to solve routine problems.

Required Reading: No required text

Assessment: Evidence of the ability to: -use at least three computer applications employing advanced features and import and export capacities for efficiency and productivity purposes -solve routine problems using support resources.

ICAICT401A DETERMINE AND CONFIRM CLIENT BUSINESS REQUIREMENTS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to determine client business requirements and verify the accuracy of the information gathered.

Required Reading: No text required.

Assessment: Evidence of the ability to: use investigative techniques to interview and document produce a clear statement of business expectations and needs, including critical business requirements.

ICAICT406A BUILD A GRAPHICAL USER INTERFACE

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to design, build and test a graphical user interface (GUI) to specification.

Required Reading: No required text.

Assessment: Evidence of the ability to: - build a GUI to requirements - demonstrate a GUI in concept and compiled form, using a development tool to assist GUI construction - provide appropriate documentation.

ICAICT408A CREATE TECHNICAL DOCUMENTATION

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to create technical documentation that is clear to the target audience and easy to navigate.

Required Reading: No text required.

Assessment: Evidence of the ability to: - establish customer needs - design and develop technical documentation, such as system, procedures, training material and user guides, incorporating appropriate standards - update document with client feedback - prepare documentation for publication.

ICAICT409A DEVELOP MACROS AND TEMPLATES FOR CLIENTS USING STANDARD PRODUCTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to develop macros and templates for clients using industry-recognised software applications.

Required Reading: No required text

Assessment: Evidence of the ability to: -develop a variety of macros and templates using at least two industry-recognised application packages.

ICAICT418A CONTRIBUTE TO COPYRIGHT, ETHICS AND PRIVACY IN AN IT ENVIRONMENT

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to maintain professional and ethical conduct as well as to ensure that personal information of stakeholders is handled in a confidential and professional manner when dealing with stakeholders in an information technology (IT) environment.

Required Reading: No required text.

Assessment: Evidence of the ability to: - analyse legislation and standards relating to professional conduct and privacy in the IT industry - contribute to the development of a code of ethics and monitor the workplace to ensure code of ethics is being applied and is appropriate - contribute to the development of a privacy policy and monitor the workplace to ensure the policy is being applied and is appropriate.

ICAICT503A VALIDATE QUALITY AND COMPLETENESS OF SYSTEM DESIGN SPECIFICATIONS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to check the system specifications against outcomes and quality standards.

Required Reading: No required text

Assessment: Evidence of the ability to: -determine audit criteria and conduct audit -review system procedures for non-compliance -specify corrective actions.

ICAICT508A EVALUATE VENDOR PRODUCTS AND EQUIPMENT

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to evaluate and test a range of vendor products and equipment against a client's business requirements.
Required Reading: No required text.
Assessment: Evidence of the ability to: - evaluate a range of vendor products and equipment against a client's functional requirements - choose the most appropriate products - document the selected items and selection rationale.

ICAICT509A GATHER DATA TO IDENTIFY BUSINESS REQUIREMENTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to identify, analyse and document business requirements.
Required Reading: No required text
Assessment: Evidence of the ability to: -document business requirements based on business strategy and current and future directions -facilitate client stakeholders to reach a consensus position.

ICAICT511A MATCH IT NEEDS WITH THE STRATEGIC DIRECTION OF THE ENTERPRISE

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to maintain professional and ethical conduct as well as to ensure that personal information of stakeholders is handled in a confidential and professional manner when dealing with stakeholders in an information technology (IT) environment.
Required Reading: No text required.
Assessment: Evidence of the ability to: - analyse legislation and standards relating to professional conduct and privacy in the IT industry - contribute to the development of a code of ethics and monitor the workplace to ensure code of ethics is being applied and is appropriate - contribute to the development of a privacy policy and monitor the workplace to ensure the policy is being applied and is appropriate.

ICAICT514A IDENTIFY AND MANAGE THE IMPLEMENTATION OF CURRENT INDUSTRY-SPECIFIC TECHNOLOGIES

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to identify and manage the implementation of specific industry technologies to meet identified industry standards.
Required Reading: No text required.
Assessment: Evidence of the ability to: - manage the implementation of new and emerging industry-specific technologies - analyse and critically evaluate features and functions of identified industry-specific technologies to an industry standard.

ICAICT515A VERIFY CLIENT BUSINESS REQUIREMENTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to deal with clients at a senior level, to identify their business requirements and verify the accuracy of the information gathered.
Required Reading: No required text
Assessment: Evidence of the ability to: -use techniques of investigation, interview and document -produce a clear statement of business expectations and needs, including critical business requirements -manage staff contributions.

ICAICT602A DEVELOP CONTRACTS AND MANAGE CONTRACTED PERFORMANCE

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to negotiate and document contractual arrangements between clients, vendors and service providers and to monitor and manage performance against agreed contractual obligations.
Required Reading: No required text.
Assessment: Evidence of the ability to negotiate and formulate extensive client support contracts by: - accessing and analysing relevant information on resources and budgets - analysing current and future client support requirements - monitoring resource use, cost efficiency and effectiveness against contractual obligations - reviewing objectives and performance measures.

ICAICT603A MANAGE THE USE OF APPROPRIATE DEVELOPMENT METHODOLOGIES

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to nominate the most appropriate methodology from traditional and non-traditional systems development methodologies for use by a team.
Required Reading: No required text.
Assessment: Evidence of the ability to: - manage a project team - review a project plan - supervise the application of a methodology to a project - evaluate a range of development methodologies and their application to a project or scenario - review documentation as required by the chosen methodology.

ICAICT606A DEVELOP COMMUNITIES OF PRACTICE

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to identify areas that would benefit from communities of practice, and to develop such communities.
Required Reading: No required text.
Assessment: Evidence of the ability to: - identify appropriate areas for CoP - manage the provision of enabling software - facilitate the development of CoP.

ICAICT608A INTERACT WITH CLIENTS ON A BUSINESS LEVEL

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to interact with clients at a management level.
Required Reading: No required text.

Assessment:- identify possible new business initiatives - propose new business to the client - formulate and implement new business - meet client requirements for support service within quality, time, target performance and cost parameters.

ICAICT609A LEAD THE EVALUATION AND IMPLEMENTATION OF CURRENT INDUSTRY-SPECIFIC TECHNOLOGIES

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to lead the identification, management and implementation of specific industry technologies to meet identified industry standards.

Required Reading: No text required.

Assessment: Evidence of the ability to: - lead the implementation of new and emerging industry-specific technologies - undertake analysis and critically evaluate features and functions of identified industry specific technologies to an in-depth industry standard.

ICAICT610A MANAGE COPYRIGHT, ETHICS AND PRIVACY IN AN IT ENVIRONMENT

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to manage the issues of copyright, professional and ethical conduct in team, as well as to ensure that personal information of stakeholders is handled in a confidential and professional manner when dealing with stakeholders.

Required Reading: No required text.

Assessment: Evidence of the ability to: - analyse legislation and standards related to copyright, professional conduct and privacy in the IT industry - contribute to the development of a code of ethics and monitor the workplace to ensure code of ethics is being applied and is appropriate - contribute to the development of a privacy policy and monitor the workplace to ensure the policy is being applied and is appropriate - ensure the adherence to copyright, ethics and privacy in a team.

ICAITU133A SEND AND RETRIEVE INFORMATION OVER THE INTERNET USING BROWSERS AND EMAIL

Locations: Footscray Nicholson, Werribee, Melton, Sunshine, City Flinders, St Albans, 21793VIC Certificate IV in Liberal Arts/21794VIC Diploma of Liberal Arts: City Flinders, Footscray Nicholson, Melton and Werribee only..

Prerequisites: Nil.

Description: Access the internet; Search the internet; Send and organise messages; Create an address book.

Required Reading: There is no required reading for this unit. The teacher will provide teaching and learning material as required.

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICANWK301A PROVIDE NETWORK SYSTEMS ADMINISTRATION

Locations: Footscray Nicholson, Industry, Sunshine, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to technically manage elements of a network, including contributing to disaster recovery plan.

Required Reading: No required text

Assessment: Evidence of the ability to: -sustain the operation of the network through maintenance of network integrity and perform diagnostic tests -contribute to the formulation of a disaster recovery plan and provide the client with an optimised network that complies with organisational guidelines -improve network and systems efficiency according to organisational guidelines -provide appropriate access to the network for users -maintain, limit or enhance user access according to authorised requests.

ICANWK302A DETERMINE AND ACTION NETWORK PROBLEMS

Locations: Footscray Nicholson, Industry, Sunshine, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to document network-related problems, determine the resources required, solve the client problem or escalate the problem to a new support level.

Required Reading: No required text

Assessment: Evidence of the ability to: -document network-related problems and determine the required resources -solve client problems or escalate the problem according to organisational guidelines -maintain the network with minimal disruption to clients.

ICANWK303A CONFIGURE AND ADMINISTER A NETWORK OPERATING SYSTEM

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit defines the competency required to create the network configuration required by a client and to set up and use administrative tools to manage the network.

Required Reading: No required text

Assessment: Evidence of the ability to: -use network administrative tools to carry out system administration tasks -manage the network file system -create the network configuration required by the client -provide user services and user accounts -provide backup and service restoration capability.

ICANWK304A ADMINISTER NETWORK PERIPHERALS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to manage an environment of networked peripheral devices, in order to provide services to client users.

Required Reading: No required text

Assessment: Evidence of the ability to: -plan and install peripherals, and connect to network and test operation -manage the use of peripheral services with workstations -maintain networked peripherals according to a maintenance schedule -rectify faulty peripheral services or devices.

ICANWK305A INSTALL AND MANAGE NETWORK PROTOCOLS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to install and manage network protocols in a networking environment.

Required Reading: No required text

Assessment: Evidence of the ability to: -configure, test and validate network protocols in order to facilitate interconnectivity -install and manage network protocols in a network, and troubleshoot when problems arise.

ICANWK401A INSTALL AND MANAGE A SERVER

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to install and manage a server. Server management includes initial configuration and testing as well as ongoing administration and troubleshooting. Server management includes initial configuration and testing, ongoing administration, software distribution and updates, profiling and monitoring servers and troubleshooting.

Required Reading: No text required.

Assessment: Evidence of the ability to: - install and configure server - configure network connectivity - manage the server operating system, including user accounts, file, network directory and print services - perform backup and recovery - update operating system and software - monitor and test server - troubleshoot server and network failures. Candidates should demonstrate competency in at least two different network operating systems.

ICANWK402A INSTALL AND CONFIGURE VIRTUAL MACHINES FOR SUSTAINABLE ICT

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to develop and implement virtualisation technologies with the goal of providing a more sustainable information and communications technology (ICT) environment.

Required Reading: No text required.

Assessment: Evidence of the ability to: - display knowledge of current sustainability practice related to ICT network design - develop, implement and maintain virtual machine environments.

ICANWK405A BUILD A SMALL WIRELESS LOCAL AREA NETWORK

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to build and arrange connectivity to a basic wireless local area network (WLAN).

Required Reading: No required text

Assessment: Evidence of the ability to: - develop, implement and maintain wireless networks - install, configure and test wireless access points - test security and network to business specifications - develop user training material - monitor and resolve wireless network issues.

ICANWK501A PLAN, IMPLEMENT AND TEST ENTERPRISE COMMUNICATION SOLUTIONS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to manage deployment and administration of an enterprise messaging environment and enterprise-wide content management and collaboration tools.

Required Reading: No text required.

Assessment: Evidence of the ability to: - design and implement an enterprise mail system - design and implement an enterprise web portal or content management system - design and implement business collaboration tools - configure network, servers and application software to provide optimal performance, meet security requirements and avoid known conflicts - configure applications to meet customisation requirements - monitor and test the performance of aspects of the solution.

ICANWK502A IMPLEMENT SECURE ENCRYPTION TECHNOLOGIES

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to ensure secure encryption is selected, implemented and monitored in an information and communications technology (ICT) network, either locally or both.

Required Reading: No text required.

Assessment: Evidence of the ability to: - analyse enterprise data security requirements - create new or review existing security plan to determine the appropriate encryption methods - rank and document appropriate encryption methods - implement encryption systems informing users of any affects - monitor and document encryption issues and compromises notifying appropriate person.

ICANWK504A DESIGN AND IMPLEMENT AN INTEGRATED SERVER SOLUTION

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to carry out the design and implementation of an integrated server solution to enable multiple operating system platforms to co-exist on the same network.

Required Reading: No text required.

Assessment: Evidence of the ability to: - produce design documents to integrate multiple server operating systems for authentication, file sharing and security - install and configure the integrated solution, according to the produced design - monitor and test the solution - troubleshoot integration problems.

ICANWK505A DESIGN, BUILD AND TEST A NETWORK SERVER

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to design, install and test a server in a complex network environment.

Required Reading: No text required.

Assessment: Evidence of the ability to: - produce design report for a server (or servers) with complex user and network service requirements - install and configure the server according to the produced design - monitor and test the server - troubleshoot server and network failures - configure a wide range of server network and security services, including DNS, DHCP, web and proxy, mail, FTP and firewall.

ICANWK506A CONFIGURE, VERIFY AND TROUBLESHOOT WAN LINKS AND IP SERVICES IN A MEDIUM ENTERPRISE NETWORK

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to use appropriate tools, equipment, software and protocols to install, operate, and troubleshoot medium enterprise switches.

Required Reading: No text required.

Assessment: Evidence of the ability to: - plan and prepare for the WAN link installation task - install and configure WAN links - configure and troubleshoot the following IP services: o NAT o DHCP o ACLs - configure and troubleshoot ADSL links - configure and troubleshoot VPNs.

ICANWK507A INSTALL, OPERATE AND TROUBLESHOOT MEDIUM ENTERPRISE ROUTERS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use appropriate tools, equipment, software and protocols to install, operate and troubleshoot medium enterprise routers.
Required Reading: No text required.
Assessment: Evidence of the ability to: - plan and prepare for the installation of an enterprise router - design a classless IP addressing scheme to suit requirements - install, configure and test the network elements to ensure interoperability within the network - apply network topologies, routing protocols and security issues - apply solutions and troubleshoot defined network problems.

ICANWK508A INSTALL, OPERATE AND TROUBLESHOOT MEDIUM ENTERPRISE SWITCHES

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use appropriate tools, equipment, software and protocols to install, operate, and troubleshoot medium enterprise switches.
Required Reading: No text required.
Assessment: Evidence of the ability to: - prepare for the installation of an enterprise switch - install, configure and test the network elements to ensure interoperability within the network - apply network topologies, protocols and security issues - apply solutions and troubleshoot defined network problems.

ICANWK509A DESIGN AND IMPLEMENT A SECURITY PERIMETER FOR ICT NETWORKS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to build a high performance, high security, failure resistant security perimeter for an enterprise information and communications technology (ICT) network.
Required Reading: No text required.
Assessment: Evidence of the ability to: - identify threats to perimeter security - develop design for a secure perimeter - deploy perimeter to meet security requirements - design and configure advanced features of perimeter devices to provide additional services - design and configure an integrated VPN solution - conduct exhaustive testing of perimeter.

ICANWK516A DETERMINE BEST-FIT TOPOLOGY FOR A LOCAL NETWORK

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to determine the most appropriate way of networking computers to meet user needs and business requirements.
Required Reading: No text required.
Assessment: Evidence of the ability to: - analyse business or organisational needs - identify the most appropriate LAN, VPN or WLAN topology - document the recommendation.

ICANWK525A CONFIGURE AN ENTERPRISE VIRTUAL COMPUTING ENVIRONMENT

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to develop and implement virtualisation technologies with the goal of providing a more sustainable information and communications technology (ICT) environment.
Required Reading: No text required.
Assessment: Evidence of the ability to: - install, configure and test virtual machines - manage environmental requirements - install and use software tools.

ICANWK529A INSTALL AND MANAGE COMPLEX ICT NETWORKS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to install and manage enterprise-wide information and communications technology (ICT) networks.
Required Reading: No text required.
Assessment: Evidence of the ability to: - design and implement a complex network that involves integrating multiple network services to meet business requirements - design and implement an appropriate security strategy for a complex network - monitor and test the performance of aspects of the solution - provide ongoing management and support of the network.

ICANWK601A DESIGN AND IMPLEMENT A SECURITY SYSTEM

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use software tools, equipment and protocols to implement a security system.
Required Reading: No text required.
Assessment: Evidence of the ability to: - evaluate network security system threats and requirements - mitigate attacks and configure firewalls - design and implement network security systems - implement VPN using SDM.

ICANWK602A PLAN, CONFIGURE AND TEST ADVANCED SERVER BASED SECURITY

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to implement advanced server security using secure authentication and network services on a network server.
Required Reading: No text required.
Assessment: Evidence of the ability to: - identify network service security vulnerabilities and appropriate controls - plan, design and configure a secure network authentication service - secure a wide range of network services to ensure server and data security including: DNS, web and proxy, mail, FTP and firewall - implement cryptographic techniques - monitor the server for security breaches.

ICANWK606A IMPLEMENT VOICE APPLICATIONS OVER SECURE WIRELESS NETWORKS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to use network tools, equipment, software and protocols to design and use voice applications over a wireless local area network (WLAN).
Required Reading: No text required.
Assessment: Evidence of the ability to: - produce voice over wireless architecture requirements - evaluate, design and implement voice applications over WLAN - use network tools to configure and test wireless infrastructure and applications.

ICANWK609A CONFIGURE AND MANAGE INTRUSION PREVENTION SYSTEM ON NETWORK SENSORS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use appropriate tools, equipment and software to implement an intrusion prevention system (IPS) on IPS sensors to mitigate network attacks.
Required Reading: No text required.
Assessment: Evidence of the ability to: - evaluate IPS requirements and configure IPS sensors - tune up IPS sensors to optimise attack mitigation - use network tools and network management tools to monitor and manage security sensor events - upgrade and maintain IPS sensors.

ICANWK610A DESIGN AND BUILD INTEGRATED VOIP NETWORKS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use appropriate tools, equipment, software and protocols to design and build an internet protocol (IP)-based integrated voice network for small to medium enterprises.
Required Reading: No text required.
Assessment: Evidence of the ability to: - produce design plan and requirements of VoIP network - configure and test for voice gateways - design site numbering plan, dial plans and priorities - use networking and network management tools - configure and test real time protocols, call management protocols and gateway signalling protocol in the network elements - implement voice systems and applications.

ICANWK611A CONFIGURE CALL PROCESSING NETWORK ELEMENTS FOR SECURE VOIP NETWORKS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use tools, equipment, software and protocols to install or upgrade call processing network elements for secure and reliable internet protocol (IP)-based communications networks.
Required Reading: No text required.
Assessment: Evidence of the ability to: - produce design plan and requirements of call processing network elements - configure and test voice gateways and LAN switches - evaluate voice call manager server requirements and design voice call systems and applications - implement voice systems and applications on voice call manager - manage security of voice network.

ICAP5039B MATCH IT NEEDS WITH THE STRATEGIC DIRECTION OF THE ENTERPRISE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: Evaluate current business strategy; Evaluate impact of changes; Develop action plans.
Required Reading: -
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAPMG401A SUPPORT SMALL SCALE IT PROJECTS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to support the management of low risk, straightforward information technology (IT) projects within an organisation.
Required Reading: No text required.
Assessment: Evidence of the ability to: - support the initiation, control and completion of a simple small-scale IT project - identify and apply requirements and expectations of a project.

ICAPMG501A MANAGE IT PROJECTS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to manage information technology (IT) projects within a medium to large organisation.
Required Reading: No text required.
Assessment: Evidence of the ability to: - define, plan, execute and close a reasonably complex project to meet project requirements.

ICAPMG609A PLAN AND DIRECT COMPLEX IT PROJECTS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to identify, plan, control and finalise complex IT projects.
Required Reading: No text required.
Assessment: Evidence of the ability to: - design, implement, manage and finalise a complex IT project - manage planning processes, scheduling, human resources, reporting and response to contingencies - ensure projects undertaken are aligned with and support organisational strategies and requirements - learn from project outcomes and refine and improve future IT project management processes.

ICAPRG301A APPLY INTRODUCTORY PROGRAMMING TECHNIQUES

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to undertake introductory programming tasks in the development of a game or application. This unit addresses the knowledge, processes and techniques necessary to develop skills to create simple applications or games.
Required Reading: No required text.
Assessment: Evidence of the ability to: - apply programming language syntax, sequence, selection and iteration control structures to the development of an application or game - produce an application or game that is designed and built from a provided program specification - confirm that the created

application or game meets the original program specifications and obtain user sign-off for completed program.

ICAPRG406A APPLY INTRODUCTORY OBJECT-ORIENTED LANGUAGE SKILLS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to undertake introductory programming tasks using an object-oriented programming language. Competency includes tool usage, documentation, debugging and testing techniques in support of the programming activities.
Required Reading: No text required.
Assessment: Evidence of the ability to: - use an application program to design and build standard reusable software modules in response to a design specification - generate code documentation - undertake testing to confirm that the created application meets the original specification and solves original problem.

ICAPRG409A DEVELOP MOBILE APPLICATIONS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to develop, debug, test and deploy applications for hand-held devices, such as mobile phones, pocket PCs, personal digital assistants (PDAs) and enterprise digital assistants (EDAs).
Required Reading: No required text
Assessment: Evidence of the ability to: -design, build, test and deploy applications for small devices: -mobile phones -pocket PCs -personal digital assistants (PDAs) -enterprise digital assistants (EDAs).

ICAPRG417A APPLY MATHEMATICAL TECHNIQUES FOR SOFTWARE DEVELOPMENT

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use basic mathematical methods and operations with real numbers and their precedence, the evaluation and construction of formulas in standard and computer notation, and the use of Boolean algebra, data types and computer storage.
Required Reading: No text required.
Assessment: Evidence of the ability to: - solve and evaluate various mathematical problems in various computational contexts - demonstrate a knowledge, use and manipulation of: - Boolean algebra - number types - memory storage.

ICAPRG425A USE STRUCTURED QUERY LANGUAGE

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use a structured query language (SQL) to define, create and manipulate database structures and associated data in a relational database.
Required Reading: No text required.
Assessment: Evidence of the ability to: - design a simple relational database - use SQL to create database structures, and store, retrieve and manipulate data in a relational database - create a variety of SQL queries to match client requirements'' - create and use views and stored procedures.

ICAPRG527A APPLY INTERMEDIATE OBJECT-ORIENTED LANGUAGE SKILLS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to undertake intermediate level programming tasks using an object-oriented programming language.
Required Reading: No required text
Assessment: Evidence of the ability to: -design and build application programs from a problem scenario and program specification.

ICAPRG601A DEVELOP ADVANCED MOBILE MULTI-TOUCH APPLICATIONS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to design, develop, debug, test and deploy applications for hand-held devices such as mobile phones, pocket PCs, personal digital assistants (PDAs) and enterprise digital assistants (EDAs) using advanced features of these devices.
Required Reading: No required text.
Assessment: Evidence of the ability to: - design applications for small devices that allow multi-touch user input and have advanced mobile features - build and test these applications - deploy these applications on mobile phones, pocket personal computers, PDAs and EDAs.

ICAPRG602A MANAGE THE DEVELOPMENT OF TECHNICAL SOLUTIONS FROM BUSINESS SPECIFICATIONS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to manage the process of compiling client business specifications to produce business solutions for consideration.
Required Reading: No required text.
Assessment: Evidence of the ability to: - adapt technologies to specified technical solutions - use site-design software and hardware - evaluate client specifications against accepted industry practices - produce technical solutions from business specifications - produce information that can be shared between businesses - apply design concepts to business solutions - produce technical reports - make recommendations and offer optimum design solutions.

ICAPRG603A CREATE CLOUD COMPUTING SERVICES

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to design, build, test and deploy web services and cloud computing applications to specification.
Required Reading: No required text.
Assessment: Evidence of the ability to: - design, build, test and deploy a web service to specification that can be accessed and used from a separate web application - design, build, test and deploy a cloud computing application to specification that can be accessed from a variety of portals - document the completed development.

ICAS3031B PROVIDE ADVICE TO CLIENTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: Analyse client support issues; Provide advice on software, hardware or network; Obtain client feedback.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAS5102B ESTABLISH AND MAINTAIN CLIENT USER LIAISON

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: Determine support areas; Develop support procedures; Assign support personnel.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAS5192B CONFIGURE AN INTERNET GATEWAY

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: Confirm client requirements and network equipmentReview security issues; Install and configure gateway products and equipment; Configure and test node.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAS5199B MANAGE BUSINESS WEBSITES AND SERVERS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: Maintain business website and contents; Maintain business security of the website; Monitor business website performanceUndertake capacity planning.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAS5202B ENSURE PRIVACY FOR USERS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: Review privacy policy in relation to legislation; Determine policy shortfalls; Update and review policies.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICASAD501A MODEL DATA OBJECTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to understand business operations, identify entities and data, diagrammatically represent their relationships and prepare a data model.

Required Reading: No required text

Assessment: Evidence of the ability to: -model valid data objects -normalise the model -validate the model.

ICASAD502A MODEL DATA PROCESSES

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to gather process data and business information in order to model data processes within an organisation.

Required Reading: No required text

Assessment: Evidence of the ability to: -identify data processes that represent the client's business reality -model these processes according to industry and organisation standard -document the model.

ICASAD504A IMPLEMENT QUALITY ASSURANCE PROCESSES FOR BUSINESS SOLUTIONS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to define and implement quality assurance processes and procedures to ensure that business solutions achieve quality performance expectations.

Required Reading: No required text.

Assessment: Evidence of the ability to: - plan and implement appropriate processes and procedures to ensure quality expectations are met - produce quality standards that are quantitative and applied universally - document quality assurance standards.

ICASAD505A DEVELOP TECHNICAL REQUIREMENTS FOR BUSINESS SOLUTIONS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to develop technical and related requirements that will enable business solutions to be implemented in an organisation.

Required Reading: No required text.

Assessment: Evidence of the ability to: - identify the internal and external technical environments required to provide a business solution - develop a corresponding list of technical requirements - analyse the impact of the technical solution - ensure that the nominated hardware and software are functional.

ICASAD506A PRODUCE A FEASIBILITY REPORT

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to recommend the preferred scenario from a range of feasible options offered to the client.

Required Reading: No required text

Assessment: Evidence of the ability to: -manage and review work done by others in the: -identification of required services -scope of a project -solutions to client's requirements that fit within the constraints -review a prepared feasibility report.

ICASAS301A RUN STANDARD DIAGNOSTIC TESTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to troubleshoot problems and conduct diagnostic tests on a range of platforms.

Required Reading: No required text

Assessment: Evidence of the ability to: -troubleshoot hardware and OS problems -

conduct diagnostic tests on a range of platforms according to preventative maintenance and diagnostic policy -identify the root causes of the problems -scan systems for computer viruses -remove viruses using software tools and procedures -remove viruses by restoring backups.

ICASAS303A CARE FOR COMPUTER HARDWARE

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to manage the maintenance and location of hardware.
Required Reading: No required text
Assessment: Evidence of the ability to: -perform diagnostic functions by replacing components, reloading software and by using operating system and other diagnostic tools -establish siting requirements for system hardware and associated peripheral devices -implement safe work practices -determine maintenance requirements and establish maintenance schedule -apply appropriate quality standards to computer hardware and peripherals.

ICASAS304A PROVIDE BASIC SYSTEM ADMINISTRATION

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to implement components of systems backup, restore, security and licensing in a stand-alone or client server environment.
Required Reading: No required text
Assessment: Evidence of the ability to: -perform systems backup, restore and maintain correct usage according to licensing agreements in a stand-alone or client server environment -maintain software licence records and check for copyright compliance within the system -maintain security access details in a register and apply access controls on (network) resources.

ICASAS305A PROVIDE IT ADVICE TO CLIENTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to provide IT advice and support to clients, including the communication of comprehensive technical information.
Required Reading: No required text
Assessment: Evidence of the ability to: -investigate client support requests and provide a documented solution after consultation with client -convey comprehensive technical information to clients in a clear, concise, jargon-free and coherent manner -access technical manuals and 'help' documentation.

ICASAS306A MAINTAIN EQUIPMENT AND SOFTWARE

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to carry out maintenance and fault repair according to organisational procedures, in order to keep equipment and software operating.
Required Reading: No required text
Assessment: Evidence of the ability to: -undertake maintenance according to maintenance procedures -resolve a defined range of equipment and software problems -maintain accurate records according to organisational guidelines.

ICASAS307A INSTALL, CONFIGURE AND SECURE A SMALL OFFICE HOME OFFICE NETWORK

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to identify available network components relevant to client requirements and to install, configure and secure those components as part of a small office or home office (SOHO) network.
Required Reading: No required text
Assessment: Evidence of the ability to: -identify the most relevant network hardware and software equipment to meet client requirements -install, configure and test the network according to client requirements, and produce appropriate documentation -identify possible security threats and secure the network.

ICASAS405A IDENTIFY AND EVALUATE IT INDUSTRY VENDOR TECHNOLOGIES

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to research, evaluate and recommend an industry vendor to supply IT components and to negotiate with the vendor for supply of identified components. This unit of competency provides for several approaches, with an emphasis on researching and analysing alternative options in dealing with vendors when acquiring IT components. It covers testing, comparisons and evaluations based on the abovementioned elements, as well as consideration of such other factors as after-sales service and reliability.
Required Reading: No required text
Assessment: Evidence of the ability to: -identify an appropriate vendor to supply components according to organisational requirements -demonstrate consistency in the acquisition of technical and business requirements.

ICASAS419A SUPPORT SYSTEM SOFTWARE

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to operate and support system software.
Required Reading: No text required.
Assessment: Evidence of the ability to: - monitor system software performance according to vendor and organisational benchmarks - maintain system performance to these benchmarks - use a wide range of features and system tools.

ICASAS502A ESTABLISH AND MAINTAIN CLIENT USER LIAISON

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to establish and maintain client user liaison in an information technology (IT) environment, post support implementation. This occurs after the business critical functions have been determined.
Required Reading: No text required.
Assessment: Evidence of the ability to: - establish and maintain client liaison in an IT environment - establish procedures for providing required support - identify IT skill requirements and assign appropriate support personnel - show personal responsibility and autonomy in performing complex technical operations or organising others.

ICASAS512A REVIEW AND MANAGE DELIVERY OF MAINTENANCE SERVICES

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to review and manage the delivery of maintenance services.
Required Reading: No text required.
Assessment: Evidence of the ability to: - analyse and report on faults and restoration performance and compliance with SLA - analyse and prioritise requests according to business requirements - review infrastructure and document discrepancies with expected service delivery - implement cost-effective solutions and evaluate impact.

ICASAS514A PERFORM INTEGRATION TESTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to ensure that the components of the system operate together to the expected standard.
Required Reading: No required text.
Assessment: Evidence of the ability to: - perform integration requirements for the units of the particular system - determine whether the units of the system operate according to requirement specifications - prepare reports in compliance with documentation and reporting standards.

ICASAS517A USE NETWORK TOOLS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use tools to assist in managing a network effectively.
Required Reading: No text required.
Assessment: Evidence of the ability to: - identify and use appropriate tools for: o monitoring network performance o identifying network threats o isolating security breaches.

ICASAS601A IMPLEMENT CHANGE-MANAGEMENT PROCESSES

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to apply techniques that facilitate the planning, implementation and monitoring of information technology change.
Required Reading: No text required.
Assessment: Evidence of the ability to: - identify elements that require changing - plan, implement, monitor and review change and apply guidelines and policies to the change-management process - maintain appropriate version control - maintain compliance with existing accessibility and other policies.

ICAT3025A RUN STANDARD DIAGNOSTIC TESTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: Operate system diagnostics; Scan system for viruses.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAT5079B PERFORM INTEGRATION TEST

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: Prepare for test; Conduct test; Analyse and classify results.
Required Reading:-

ICAT5081B PERFORM SYSTEMS TEST

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: Prepare for test; Conduct test; Analyse and classify results.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAU1128B OPERATE A PERSONAL COMPUTER

Locations: Footscray Nicholson, Werribee, Industry, Footscray Park, Sunshine, St Albans.
Prerequisites: Nil.
Description: Start the computer;Access basic system information;Navigate and manipulate desktop environment;Organise basic directory/folder structure and files;Organise files for user and/or organisation requirements;Print information;Shut down computer.
Required Reading: No required text
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAU1129B OPERATE A WORD PROCESSING APPLICATION

Locations: Footscray Nicholson, Werribee, Melton, Sunshine, City Flinders, Off-shore, St Albans, 21939VIC Certificate III in ESL (Further Study) - Liaoning University in Shenyang, Shandong-Jianzhu University in Jinan, Henan University in Keifeng, Henan College of Finance & Taxation in Zhengzhou, Central University of Finance and Economics in Beijing, China, City Flinders, Footscray Nicholson, Melton, St Albans, Sunshine and Werribee..
Prerequisites: Nil.
Description: Create documents;Customise basic settings to meet page layout conventions;Format document;Create tables;Add images;Use mail merge;Print documents.
Required Reading: There is no required reading for this unit. The teacher will provide teaching and learning material as required.
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments. 21939VIC Certificate III in ESL (Further Study) Assessment may include: records of teacher's observations of students' activities; observation checklists; verbal questioning; a portfolio of work and other documents; interview or written test; self-assessment; practical tasks; samples of work and third-party feedback.

ICAU1130B OPERATE A SPREADSHEET APPLICATION

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to correctly operate spreadsheet applications and perform basic operations.
Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAU1131B OPERATE A DATABASE APPLICATION

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to operate database applications and perform basic operations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAU1132B OPERATE A PRESENTATION PACKAGE

Locations: Footscray Nicholson, Werribee, Sunshine, City Flinders, Off-shore, St Albans, 21940VIC Cert IV in ESL (Further Study) - Liaoning University, China, City Flinders, Footscray Nicholson, St Albans and Werribee..
Prerequisites: Nil.
Description: This unit defines the competency required to operate presentation applications and perform basic operations.
Required Reading: There is no required reading for this unit. The teacher will provide teaching and learning material as required.
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments. 21940VIC Certificate IV in ESL (Further Study) Assessment may include: records of teacher's observations of students' activities; observation checklists; verbal questioning; a portfolio of work and other documents; interview or written test; self-assessment; practical tasks; samples of work and third-party feedback.

ICAU1204B LOCATE AND USE RELEVANT ONLINE INFORMATION

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to use search engines to locate required information on the internet and assess the content of sites for accuracy, currency and/or authority.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAU2005B OPERATE COMPUTER HARDWARE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to determine, select and correctly operate basic computer hardware, generally known as peripherals and which may include input/output devices and secondary memory.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAU2006B OPERATE COMPUTING PACKAGES

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans, 21934VIC Certificate IV in ESL (Access) - Footscray Nicholson, St Albans and Werribee only..
Prerequisites: Nil.
Description: Use appropriate software;Access, retrieve and manipulate data;Access and use help functions within each application;Use keyboard and equipment.
Required Reading: There is no required reading for this unit. The teacher will provide teaching and learning material as required.
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments. 21934VIC Certificate IV in ESL (Access) Assessment may include: records of teacher's observations of students' activities; observation checklists; verbal questioning; a portfolio of work and other documents; interview or written test; self-assessment; practical tasks; samples of work and third-party feedback.

ICAU2013A INTEGRATE COMMERCIAL COMPUTING PACKAGES

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to manipulate, convert and integrate data between different two or more commercial software applications.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAU3126B USE ADVANCED FEATURES OF COMPUTER APPLICATIONS

Locations: Footscray Nicholson, VETiS.
Prerequisites: Nil.
Description: This unit defines the competency required to use computer applications employing advanced features.
Required Reading: No Required Reading
Assessment: Assessment will usually include observation of real or simulated work processes and procedures and/or performance in a project context as well as questioning on underpinning knowledge and skills. The questioning of team members, supervisors, subordinates, peers and clients where appropriate may provide valuable input to the assessment process. 22051VIC Diploma of Business (Public Relations) Assessment methods will include skills test and practical applications.

ICAUI128A OPERATE A PERSONAL COMPUTER

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit defines the competency required to operate a personal computer, including starting the PC, logging in, using and understanding desktop icons and their links to underlying program, navigating a directory structure, saving work, printing, closing down the PC.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICAWEB201A USE SOCIAL MEDIA TOOLS FOR COLLABORATION AND ENGAGEMENT

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge

required to establish a social networking presence using social media tools and applications. The unit specifically identifies the requirement to review, compare and use different types of social networking tools and applications.

Required Reading: No required text

Assessment: Evidence of the ability to: -identify different types of social media tools and applications, and issues associated with their use -access the internet, set up a social networking presence and upload and link a wide variety of files -use OHS principles and responsibilities for ergonomics, such as work periods and breaks.

ICAWEB301A CREATE A SIMPLE MARKUP LANGUAGE DOCUMENT

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to design, create and save a basic markup language document using a text editor.

Required Reading: No required text

Assessment: Evidence of the ability to: -create and save a markup language document -use a markup language without the automated generation of code.

ICAWEB303A PRODUCE DIGITAL IMAGES FOR THE WEB

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to produce and manipulate images suitable for use in website development.

Required Reading: No required text

Assessment: Evidence of the ability to: -analyse client needs -research and source images -manipulate and produce images for use in website development meeting the requirements of the brief.

ICAWEB402A CONFIRM ACCESSIBILITY OF WEBSITES FOR PEOPLE WITH SPECIAL NEEDS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to ensure that a website is accessible to users with special needs, including people with auditory, visual, mobility, and cognitive impairments and those people who use assistive technology.

Required Reading: No text required.

Assessment: Evidence of the ability to: - test a website for accessibility - demonstrate theoretical knowledge of website content creation - communicate and negotiate with user groups, government and industry - undertake website design.

ICAWEB409A DEVELOP CASCADING STYLE SHEETS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to develop cascading style sheets (CSS) that are attached to a markup language document in order to externally define and control styles to enhance and achieve commonality between web documents.

Required Reading: No text required.

Assessment: Evidence of the ability to: - develop a website styled and formatted using CSS to user requirements - lay out page elements using CSS - test web pages in a variety of browsers - validate the CSS against industry standards.

ICAWEB411A PRODUCE BASIC CLIENT-SIDE SCRIPT FOR DYNAMIC WEB PAGES

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to produce a number of client-side scripts for dynamic web pages, using a range of features from different appropriate languages.

Required Reading: No text required.

Assessment: Evidence of the ability to: - produce basic client server-side scripts for dynamic web pages - confirm successful viewing of the active elements or objects across different platforms.

ICAWEB414A DESIGN SIMPLE WEB PAGE LAYOUTS

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to design and create simple web page layouts.

Required Reading: No text required.

Assessment: Evidence of the ability to: - develop a website according to design specifications - lay out page elements - test web pages in a variety of browsers - validate the web pages against industry standards.

ICAWEB417A INTEGRATE SOCIAL WEB TECHNOLOGIES

Locations: Footscray Nicholson, Industry, Off-campus.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge to successfully develop and implement social networking in websites.

Required Reading: No required text

Assessment: Evidence of the ability to: - select an appropriate social networking tool - integrate tool into an existing website.

ICAWEB418A USE DEVELOPMENT SOFTWARE AND IT TOOLS TO BUILD A BASIC WEBSITE

Locations: Footscray Nicholson, Industry, Off-campus.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to build a basic website that is consistent with design and technical requirements, and business expectations.

Required Reading: No required text

Assessment: Evidence of the ability to: - build a basic website to website specifications - undertake and audit against the business requirements and design needs prior to task completion and sign-off.

ICAWEB420A WRITE CONTENT FOR WEB PAGES

Locations: Industry, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to write concise and clear content for web pages on behalf of a client.

Required Reading: No text required.

Assessment: Evidence of the ability to: - write in a manner that recognises cultural differences, diversity and people with special needs - demonstrate some knowledge of website content creation - develop and upload quality content for a website.

ICAWEB429A CREATE A MARKUP LANGUAGE DOCUMENT TO SPECIFICATION

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to design, create and save a markup language document to a given specification using a text editor rather than an authoring tool.
Required Reading: No text required.
Assessment: Evidence of the ability to: - design, create and save a markup language document using a markup language without the automated generation of code.

ICAWEB501A BUILD A DYNAMIC WEBSITE
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to analyse, design, build and test a dynamic website to meet technical requirements.
Required Reading: No required text
Assessment: Evidence of the ability to: -analyse, design, implement and test a website to meet technical requirements -create efficient and effective code to meet technical requirements.

ICAWEB502A CREATE DYNAMIC WEB PAGES
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to build active or dynamic web pages.
Required Reading: No required text
Assessment: Evidence of the ability to: -produce dynamic web pages that include both client and server-side dynamic content -create efficient and effective code to meet technical requirements.

ICAWEB503A CREATE WEB-BASED PROGRAMS
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to develop web applications.
Required Reading: No required text
Assessment: Evidence of the ability to: -obtain requirements -develop web applications that keep track of user data between browser requests -document web applications.

ICAWEB504A BUILD A DOCUMENT USING EXTENSIBLE MARKUP LANGUAGE
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to design and build a valid eXtensible markup language (XML) document to suit a specified requirement.
Required Reading: No required text
Assessment: Evidence of the ability to: -respond to requirements -produce a valid XML document -test the XML document -evaluate the test results.

ICAWEB505A DEVELOP COMPLEX WEB PAGE LAYOUTS
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to design and create a web page layout to an advanced level.
Required Reading: No required text
Assessment: Evidence of the ability to: -develop a complex website layout -layout page elements to suit a variety of devices -test web pages in a variety of browsers -validate the pages against industry standards.

ICAWEB506A DEVELOP COMPLEX CASCADING STYLE SHEETS
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to develop complex cascading style sheets (CSS) that are attached to a mark-up language document.
Required Reading: No required text
Assessment: Evidence of the ability to: -develop a complex website styled and formatted using CSS -create a complex page layout using CSS -test web pages in a variety of browsers -validate the CSS against industry standards.

ICAWEB507A CUSTOMISE A COMPLEX IT CONTENT MANAGEMENT SYSTEM
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to customise an IT content management system (CMS).
Required Reading: No required text
Assessment: Evidence of the ability to: -create a CMS-powered website using an open source with additional custom functionality that is not available 'out of the box' that meets client requirements.

ICAWEB509A USE SITE SERVER TOOLS FOR TRANSACTION MANAGEMENT
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to use site server tools to build, host, track and monitor transactions on an ebusiness site.
Required Reading: No required text
Assessment: Evidence of the ability to: -select and use appropriate website server tools to maintain expected business performance and technical standards in an ebusiness environment.

ICAWEB510A ANALYSE INFORMATION AND ASSIGN META-TAGS
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to analyse material and assign meta-tags to ensure the accurate and consistent retrieval of information by users.
Required Reading: No required text
Assessment: Evidence of the ability to: -use appropriate techniques to analyse materials for meta-tagging -use software to create meta-tags -enhance and update meta-tags in line with client needs and industry developments.

ICAWEB511A IMPLEMENT QUALITY ASSURANCE PROCESS FOR WEBSITES
Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to develop and conduct a planned and systematic pattern of actions required to provide adequate confidence that websites conform to relevant standards and fulfil client expectations.
Required Reading: No required text

Assessment: Evidence of the ability to: -identify, establish and implement appropriate quality assurance standards to the website -develop and implement a continuous improvement process -develop quantitative standards -document quality assurance standards.

ICAWEB512A ADMINISTER BUSINESS WEBSITES AND SERVERS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to maintain and manage business websites and associated servers.
Required Reading: No required text
Assessment: Evidence of the ability to: -evaluate and test site-analysis software -maintain site security -monitor website performance -develop upgrade program to cater for business website performance growth.

ICAWEB516A RESEARCH AND APPLY EMERGING WEB TECHNOLOGY TRENDS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to keep up-to-date with and apply emerging web technology.
Required Reading: No required text
Assessment: Evidence of the ability to: -research, investigate and apply emerging web technology trends to a web application.

ICTSUS5187A IMPLEMENT SERVER VIRTUALISATION FOR A SUSTAINABLE ICT SYSTEM

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to install and integrate a virtual server in a network to replace multiple physical servers. This is done to reduce power requirements of individual servers.
Required Reading: No text required.
Assessment: Evidence of the ability to: - determine and meet client requirements for installation and testing of virtual server - install, integrate and test virtualisation components according to vendor and technical specifications.

ICTSUS6233A INTEGRATE SUSTAINABILITY IN ICT PLANNING AND DESIGN PROJECTS

Locations: Footscray Nicholson, Werribee, Industry, City Flinders, St Albans.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge required to integrate sustainability concepts and policies into ICT planning and design projects. It involves accessing industry information and applying legislative and occupational health and safety (OHS) guidelines.
Required Reading: No text required.
Assessment: Evidence of the ability to: - plan and integrate sustainability into ICT projects by devising strategies to conserve resources - analyse energy audit data on enterprise resource consumption - develop and monitor policies for review and improvements, benchmarking against industry best practice and attempting new approaches continuously over time.

ICTTC005C INSTALL CABLE SUPPORT SYSTEMS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts for indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. This unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANS and multi media. This unit may be applied to domestic, commercial or industrial installations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC006C PLACE AND SECURE CABLE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts for indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. This unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs, and multi media. This unit applies to high-speed data and fibre optic cabling. This unit may be applied to domestic, commercial or industrial installations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC008C TERMINATE METALLIC CONDUCTOR CABLE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts for indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. This unit applies to all communication applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs and multi-media. This unit may be applied to domestic, commercial or industrial installations. This unit applies to all metallic conductor cable types including coaxial and structured (category 5, 6 & 7) cabling. It also applies to the joing of cable in a terminating block (in/out block). Specific units of competency apply to the placing, securing and termination of particular cable types and should be used in association with this unit where applicable.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC011C PLACE, SECURE AND TERMINATE CO-AXIAL CABLE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts fro indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. T his unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs, and multi media. This unit may be applied to domestic, commercial or industrial installations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test,

simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC012C INSTALL FUNCTIONAL AND PROTECTIVE TELECOMMUNICATIONS EARTHING SYSTEMS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts for indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. This unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs, and multi media. This unit may be applied to domestic, SOHO (Small Office Home Office), commercial or industrial installations and covers multi-storey and multi-site locations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC017C ALTER SERVICES TO EXISTING CABLE SYSTEM

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts for indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. This unit applies to all communications applications whether digital or analogue including telephony, data, video and customer premises equipment. This unit applies to all communications applications whether digital or analogue including telephone, data, video including digital broadcasting, computer networks including LANs and WANs, and multi-media. This unit may be applied to domestic, commercial or industrial installations. This unit applies to the jointing of copper telecommunications cable that may occur in underground situations, in pits or in jointing enclosures or above ground customer premises. It applies to all metallic conductor cable types other than co-axial and certified category 5 installations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC022C ORGANISE AND MONITOR CABLING TO ENSURE COMPLIANCE WITH REGULATORY AND INDUSTRY STANDARDS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to the organisation and monitoring or work within a work team. It applies to all metallic conductor cable types other than co-axial and certified category 5 installations. This unit applies to all contexts for indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. This unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs and multi media. This unit may be applied to domestic, commercial or industrial installations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC049C INSTALL CUSTOMER PREMISES SYSTEMS AND EQUIPMENT

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts fro indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. T his unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs, and multi media. This unit may be applied to domestic, commercial or industrial installations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC052C CUTOVER NEW CUSTOMER PREMISES SYSTEMS AND EQUIPMENT

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts fro indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. T his unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs, and multi media. This unit may be applied to domestic, commercial or industrial installations.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC053C TRAIN CUSTOMERS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all contexts fro indoor and outdoor installation within a customer premises and applies to both customer premises cabling and customer premises equipment. T his unit applies to all communications applications whether digital or analogue including telephony, data, video including digital broadcasting, computer networks including LANs and WANs, and multi media. This unit may be applied to domestic, commercial or industrial installations. This unit can be undertaken by CPE installation staff or dedicated customer trainers. (The latter would apply particularly to the very large installations).
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC056C INSTALL NETWORK TELECOMMUNICATIONS EQUIPMENT

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit may apply to switching, transmission and radio (both fixed and mobile) network and the various transmission paths i.e. cable, optic fibre, radio, microwave and satellite. The unit applies to installation of both new, additional and replacement equipment. Termination of cables are covered broadly in this standard and thus it should be read in conjunction with Telecommunications Cabling Competency Standards:UNIT ICTTC008C - Terminate metallic conductor cable;UNIT ICTTC010C - Place, secure and terminate optical fibre cable;UNIT ICTTC011C - Place,

secure and terminate coaxial cable
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC068C INSTALL TELECOMMUNICATIONS SERVICE TO A BUILDING

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit relates to brining a telecommunications service from the broader network to a customer's premises. Installation of cabling within a building and installation of telecommunications connections within a building are dealt with in the Telecommunications Cabling National Competency Standards.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC071C INSTALL PAY TV SET TOP UNIT

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to the installation of all types of Customer Pay TV service and data casting services on customer premises. Fault finding and rectification is covered in ICTTC106 Locate and rectify set top unit faults.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC076C COMPLETE NETWORK EQUIPMENT/SOFTWARE UPGRADES

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit may apply to switching, transmission and radio (both fixed and mobile) network and the various transmission paths i.e. cable, optic fibre, radio, microwave and satellite. This units applies to computer systems including Local Area Networks (LANs) and Wide Area Networks (WANs.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC086C UNDERTAKE ROUTINE MAINTENANCE OF THE TELECOMMUNICATIONS NETWORK

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit may apply to switching, transmission and radio (both fixed and mobile) network and the various transmission paths i.e. cable, optic fibre, radio, microwave and satellite.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC087C UNDERTAKE REMOTE REPAIR OF NETWORK FAULTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit may apply to switching, transmission and radio (both fixed and mobile) network and the various transmission paths i.e. cable, optic fibre, radio, microwave and satellite.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC088C LOCATE AND RECTIFY NETWORK FAULTS ON A FIRST IN BASIS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit may apply to switching, transmission and radio (both fixed and mobile) network and the various transmission paths i.e. cable, optic fibre, radio, microwave and satellite. This unit applies to computer systems including Local Area Networks (LANs) and Wide Area Networks (WANs).
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC089C REPAIR AND REPLACE TELECOMMUNICATIONS NETWORK HARDWARE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit may apply to switching, transmission and radio (both fixed and mobile) network and the various transmission paths i.e. cable, optic fibre, radio, microwave and satellite. All work undertaken on site is under instruction from the network management/control centre. Responsibility for the fault/problem rests with that centre. This unit covers work at escalation tier 1. Units ICTTC088C and ICTTC090C cover similar work at escalation tiers 2 and 3.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC101C LOCATE AND DIAGNOSE ELECTRONIC FAULTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all telecommunications applications including telephony, data, video and multi media. This unit should be applied with units dealing with specific able types and installation environments. This unit applies to computer systems including Local Area Networks (LANs) and Wide Area Networks (WANs).
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC106C LOCATE AND RECTIFY PAY TV SET TOP UNIT FAULTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: This unit applies to all types of Customer Pay TV service and data casting services on customer premises. Installation is covered in ICTTC071 Install Pay TV set top unit. Cabling aspects of installation are covered in a range of units in the

Certificate in Telecommunications (Cabling).

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC140A USE HAND AND POWER TOOLS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description:unit applies to the skills required to safely use hand and power tools in the workshop and on the worksite.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC147A ADMINISTER A DATA COMMUNICATIONS NETWORK (LAN OR WAN)

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit applies to the management and administration of a local area network or wide area network.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTC153A WORK SAFELY NEAR POWER INFRASTRUCTURE

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.

Prerequisites: Nil.

Description: This unit describes the requirements and conditions that must be met when telecommunications workers conduct operations in the vicinity of substantial safety hazards including work: At heights; Near electrical distribution infrastructure, radiation devices or other services; In confined space

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

ICTTEN6206A PRODUCE AN ICT NETWORK ARCHITECTURE DESIGN

Locations: Footscray Nicholson, Werribee, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit describes the performance outcomes, skills and knowledge required to compile, and evaluate the business specifications from a client and produce a set of architecture design solutions that will cater for present and future forecast demands.

Required Reading: No text required.

Assessment: Evidence of the ability to: - adapt technologies to specified technical solutions - use site design software and hardware - evaluate client specifications against accepted industry practices - produce technical designs from business specifications - analyse feedback from client and make adjustment to the proposal - produce information that can be shared between businesses - apply design concepts to business solutions - produce technical reports - make recommendations and offer optimum design solutions.

ITD1001 ICT PRACTICE A

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions.

Prerequisites: Nil.

Description: Develops a set of skills associated with oral, written, technical and online communication focusing on creative ways in which ideas can be presented, critiqued and debated. Students will be involved in locating and assembling reliable sources of information for collation and presentation. Student will deal with issues related to the organisations code of ethics, protection on privacy and information security. Content includes: effective use of internet and search engines for information gathering; development of personal online portfolios; sound academic and technical writing skills; case studies in IT privacy and professional ethics.

Credit Points:6

Learning Outcomes:1. Develop personal learning pathways and portfolios 2. Use information technology effectively 3. Research, write and present information 4. Understand code of ethics related to IT industry 5. Understand privacy issues within the context of the ICT industry 6. Develop technical documentation 7. Use social networking tools to establish a professional presence

Class Contact: This unit will have 60 contact hours per semester

Required Reading: School of ICT, Participant Resource Guide-ITD1001, VU.

Assessment: Portfolio, Personal Portfolio Assignment, 20%. Tutorial Participation, Participation in class debates and online reflection, 20%. Case Study, Produce technical documentation, 30%. Assignment, Research Assignment and presentation, 30%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study and be deemed competent.

ITD1002 PROGRAMMING A

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions Henan University, China; AMACU, Philippines.

Prerequisites: Nil.

Description: Apply introductory programming skills using an object oriented language to develop, evaluate and modify GUI object oriented software applications. Content includes: introduction to control structures, predefined classes from libraries, application of all GUI controls to interface design, data validation, debugging, testing and documentation. The applications will be able to search and sort a single dimension array and read and write data to external files.

Credit Points:6

Learning Outcomes:1. Apply basic language syntax and control structures 2. Apply basic object-oriented principles in the target language 3. Use a modern IDE to create, build and deploy simple GUI applications 4 Use basic algorithms to process single dimensional arrays and access files 5. Test and Debug applications, 6. Create and maintain documentation

Class Contact: This unit will have 60 contact hours per semester

Required Reading: School of ICT, Participant Resource Guide- ITD1002, VU.

Assessment: Exercise, Practical tasks, 30%. Test, Programming language theory test, 30%. Examination, Final practical Exam ¿ Design, develop and implement a Java Application., 40%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study and be deemed competent.

ITD1003 NETWORKING

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions Henan University, China; AMACU, Philippines.

Prerequisites: Nil.

Description: Covers fundamentals of modern data communication and internetworking infrastructure. Use network protocol models to explain the layers of communications in data networks. Student will design and build networks using routers and basic switches using classless IP addressing scheme. Mapped to CISCO certification - units Exploration 1 and 2 and progressing towards the CCNA and CCENT certifications.

Credit Points:12

Learning Outcomes:1 Explain how communication works in data networks and the Internet also explain the fundamental Ethernet concepts such as media, services and operation 2 Employ basic cabling and network designs to connect devices 3 Describe the importance of addressing and naming schemes at various layers of data networks and compare and contrast classful and classless IP addressing 4 Describe the protocols and services provided by the OSI and TCP/IP models and explain how each layer operates in various networks 5 Describe the purpose, nature, and operations of a router, its routing tables and the role of routing protocols in the context of modern network design 6 Configure a router, static and dynamic routing protocols and use commands to troubleshoot errors.

Class Contact: This unit will have 120 contact hours per semester

Required Reading: Required ReadingSchool of ICT, Participant Resource Guide-ITD1003, VU. Required Reading

Assessment: Exercise, Lab activities from CISCO Academy, 20%. Test, Skills Tests compulsory for CISCO Academy, 30%. Examination, Two tests towards Industry Certification ¿ CISCO Academy Exploration 1 & 2, 50%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study and be deemed competent.

ITD1004 WEB TECHNOLOGIES

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions Henan University, China; AMACU, Philippines.

Prerequisites: Nil.

Description: Plan, design and build an interactive, dynamic commercial website with the latest HTML standards and website development programs. Use JavaScript to provide client/side interactivity including validating forms and controlling browser windows. Create and apply CSS to develop page layouts and templates; Prepare and optimise images for websites and create simple flash animations. Students will research and review the appropriateness and quality of website design; based on a solid understanding of good design principles; user interface considerations; and accessibility issues.

Credit Points:12

Learning Outcomes:1. Understand and identify website goals, objectives and target audiences. 2. Analyse website outcomes for successful website planning and proposals. 3. Apply website objectives into creative website design. 4. Develop a live interactive website using HTML/HTML5 and CSS mark up language. 5. Demonstrate user-friendly principles through web interface design and accessibility. 6. Enhance website interactivity through the use of Flash and JavaScript.

Class Contact: This unit has 120 contact hours in one semester

Required Reading: David, M 2010, HTML5: Designing Rich Internet Applications (Visualizing the Web), Focal Press.

Assessment: Exercise, Practical tasks, 20%. Case Study, Case study: Plan, design, build, enhance and test website, 80%.

ITD1005 WEB DATABASE TECHNOLOGIES

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions Henan University, China; AMACU, Philippines.

Prerequisites:ITD1002 - PROGRAMMING AITD1006 - DATABASES AND INFORMATION PROCESSING

Description: Develops dynamic web-based applications using server-side scripting technology including various concepts of multitier architectures. Students implement database connectivity; perform searches; add, update and delete records in web-based applications. Content-includes: fundamentals of server-side scripting, server-side object-oriented programming, database-connectivity, database query language, web server security.

Credit Points:12

Learning Outcomes:1. Describe the differences between client-side and server-side web technologies. 2. Use available resources to set up and maintain web server environment. 3. Describe and use various methods of maintaining the state of a web application 4. Build server-side pages that connect to database, perform searches, update records, add and delete records. 5. Secure and deploy the web site

Class Contact: This unit has 120 contact hours in one semester

Required Reading: Stobart, S & Parsons, D 2008, Dynamic Web Application Development using PHP and MySQL, Course Technology.

Assessment: Exercise, Practical Lab exercises, 20%. Project, Assignment, 40%. Examination, Final Exam, 40%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study .

ITD1006 DATABASES AND INFORMATION PROCESSING

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions Henan University, China; AMACU, Philippines.

Prerequisites: Nil.

Description: Introduces fundamental business processing concepts underpinning the analysis and design of information systems. The unit covers the purpose of common business processes, source documents and process modelling. Students will use standard techniques to identify system requirements and design a simple database system. Content includes: systems concepts; common business source documents; Systems Development Life Cycle (SDLC), process modelling, Entity-Relationship (ER) modelling; relational database design using ER modelling, SQL (Structured Query Language), normalisation.

Credit Points:12

Learning Outcomes:1. Identify common information business processes and the common documents used. 2. Distinguish between several different system development lifecycles 3. Create SQL (Structured Query Language) queries to extract data and manage data in relational databases. 4. Apply Entity Relationship modelling techniques of create logical designs for relational databases. 5. Apply normalisation techniques 6. Design simple Use Case diagrams to model system requirements

Class Contact: This unit has 120 contact hours in one semester

Required Reading: Magal, S R & Word, J 2009, 1st Ed, Essentials of Business Processing and Information, Wiley. D'orazio, R & Happel; G 1996, Practical Data Modelling for Database Design, John Wiley & Sons.

Assessment: Test, SQL Test, 20%. Case Study, Data Modelling report on Case Study ¿ Modelling data requirements using a Use Case and ER diagram, 40%. Examination, Final Exam covering all objectives, 40%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study and be deemed competent.

ITD1007 MANAGING IT

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions Henan University, China; AMACU, Philippines.

Prerequisites: Nil.

Description: Covers managing IT services according to best practice processes for the support and delivery of high quality and cost effective IT solutions which underpin business processes. Effective management of Service level agreements to manage IT Services throughout the IT Service Lifecycle is discussed together with emerging technologies relating to Green IT and IT virtualisation. Utilise standard project management techniques and tools to control and successfully delivery IT Projects within scope, time and cost. Uses the software tools to help with planning, organising, monitoring and controlling the lifecycle of a project.

Credit Points:12

Learning Outcomes:1. Understand and document service desk functions 2. Use Service Management best practice methodology to manage Incidents, problems and change 3. Analyse and use of Service Level Agreements 4. Describe the project life cycle and understand the fundamentals of managing projects 5. Understand and explain best practice methodology approach to monitoring the quality of products created during the life of a project. 6. Use Project application to manage project life-cycle

Class Contact: This unit has 120 contact hours in one semester

Required Reading:tSMF International 2007, ITIL Foundation IT Service Management Book. Van Haren Publishing. Schwalbe, K 2011, 6th Ed, Information Technology Project Management, Cengagebrain.

Assessment: Exercise, Lab tasks ¿ ITIL Case Study, 20%. Case Study, Project management Assignment and presentation - Case study, 40%. Examination, Final Exam aligned to industry certification, 40%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study and be deemed competent.

ITD1008 OPERATING SYSTEMS

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions Henan University, China; AMACU, Philippines.

Prerequisites: Nil.

Description: An overview of modern operating system concepts and architecture, process and memory management and file systems. In depth practical case study will involve student in installation and setting up services and securing a Linux desktop based operating system. Students will interact with the operating system using advanced command-line processing and basic shell scripts. Contributes towards Linux professional Institute and/or Red Hat vendor certification.

Credit Points:12

Learning Outcomes:1. Identify the fundamentals of operating systems – memory, file systems, processes 2. Plan and Install an operating system in a multi user environment 3. Interact with the operating system using GUI desktop tools 4. Use the command line to interact with the operating system 5. Understand file systems and maintain basic file system security 6. Configure basic network connectivity and file sharing

Class Contact: This unit has 120 contact hours in one semester

Required Reading: School of ICT, Participant Resource Guide-ITD1008, VU.

Assessment: Exercise, Practical Lab Tasks aligned to industry certification, 30%. Assignment, Install and configure operating system, 40%. Examination, Exam aligned to Industry Certification, 30%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study and be deemed competent.

ITD1009 INTRODUCTION TO OBJECT ORIENTED PROGRAMMING CONCEPTS

Locations: Footscray Nicholson, Werribee, City Flinders, Off-shore, St Albans, Henan University, China; AMACU, Philippines.

Prerequisites: Nil.

Description: This unit provides knowledge of basic object oriented programming concepts and their application to develop, evaluate modify and test GUI based object oriented software applications. It also develops an understanding of the features of modern IDE based development software development including debugging, profiling, code generation and development of graphical user interfaces. Content includes: programming control structures, array-based algorithms, usage of predefined classes from libraries, problem solving methodology that includes defining the problem, designing a solution and implementing the solution; inheritance and basic polymorphism, developing GUI based applications, data validation, debugging, testing and documentation.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Understand and apply basic language syntax and control structures
- Describe basic object-oriented language principles including inheritance and polymorphism
- Use a modern IDE to create, build and deploy GUI applications that use user-defined classes
- Solve problems using algorithms involving arrays and other built-in data structures
- Test and debug and document programming applications Create and maintain documentation

Class Contact: This unit will have 90 contact hours per semester that is broken down into 5 hours per week over an 18 week semester.

Required Reading: School of ITCI, VU (2012) Participant Resource Guide - ITD1009

Assessment: Written Test Laboratory Work, Practical programming tasks , 20%. Assignment, Programming Assignment ¿ Design, implement and test a Java-based application, 50%. Test, Written Test, 30%.

ITD1010 COMMUNICATION FOR THE COMPUTER PROFESSIONAL

Locations: Footscray Nicholson, Werribee, City Flinders, Off-shore, St Albans, Henan University, China; AMACU, Philippines.

Prerequisites: Nil.

Description: This unit of study aims to develop a set of skills associated with oral, written, technical and online communication focusing on creative ways in which ideas can be presented, critiqued and debated as well as focussing on academic and technical communication skills. Students will be involved in locating and assembling reliable sources of information for collation and presentation. Students will use their research skills to research, evaluate and report on emerging issues relevant to the IT industry, in particular, dealing with issues related to the organisations code of ethics, protection on privacy, sustainability within IT and information security. Content includes: effective use of internet and search engines for information gathering; development of personal online portfolios; sound academic and technical writing skills; case studies relating to IT privacy professional ethics and sustainability within IT; career options in IT, job application development and interview skills.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Research and report on emerging issues relevant to the IT industry and contribute to the development of a policy document in relation to sustainability in the industry.
- Understand the meaning of code of ethics and privacy issues related to IT industry.
- Develop personal learning pathways and extend and enhance personal portfolios. Prepare job applications and attend interviews.
- Use social networking tools to establish a professional presence.

Class Contact: This unit will have 90 contact hours per semester that is broken down into 5 hours per week over an 18 week semester.
Required Reading: Guffey, M.E. & Loewy, D 2010 7th Edition Business Communications: Process and Product South-Western Pub.
Assessment: Portfolio, Personal Portfolio Assignment, 20%. Tutorial Participation, Participation in class debates and reflection, 20%. Report, Report on emerging issues, 40%. Presentation, Report Presentation, 20%.

ITD1021 ICT PRACTICE B

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions.
Prerequisites:ITD1001 - ICT PRACTICE A
Description: Building on the skills obtained in ITD1001 this unit further develops academic and technical communication skills. Students will be involved in analysing and creating policy within the context of a sustainable IT industry and employment in the IT industry. Content includes: OHS responsibilities, sustainability within IT, career options in IT, job application development and interview skills. Students will use their research skills to research, evaluate and report on emerging issues relevant to the IT industry.
Credit Points:6
Learning Outcomes:1. Extend and enhance personal portfolios 2. Understand, identify and report on workplace hazards and OHS issues. 3. Prepare job applications and attend interviews. 4. Access and convey conceptual information in relation to organisational needs 5. Contribute to the development of a policy document in relation to a sustainable IT industry 6. Research and report on emerging issues relevant to the IT industry.
Class Contact: This unit will have 60 contact hours per semester
Required Reading: School of ICT, Participant Resource Guide-ITD1021, VU.
Assessment: Assignment, OHS and policy development, 25%. Report, Report and presentation on emerging issues, 25%. Portfolio, Portfolio Presentation, 50%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study and be deemed competent.

ITD1022 PROGRAMMING B

Locations: Footscray Nicholson, Werribee, City Queen, City Flinders, Off-shore, St Albans, Interstate delivery with partner institutions Henan University, China; AMACU, Philippines.
Prerequisites:ITD1002 - PROGRAMMING A
Description: Builds on skills gained from ITD 1002 to further develop skills in object oriented application development. Students will connect applications to databases and develop complex GUI solutions. Content includes: creation of user defined classes, the OO principles of inheritance and polymorphism; data structures; and unit testing. Students will develop an understanding of the features of modern IDE based development software development including debugging, profiling, code generation and development of graphical user Interfaces.
Credit Points:6
Learning Outcomes:1. Create and build GUI applications that use user-defined classes 2. Build solutions (applications) that can connect to, query and update a relational database 3. Create and run unit tests 4. Debug and profile Object Oriented Applications 5. Create and maintain documentation
Class Contact: This unit will have 60 contact hours per semester
Required Reading: School of ICT, Participant Resource Guide- ITD1022, VU.
Assessment: Exercise, Practical tasks, 20%. Case Study, Assignment ¿ Design, Develop and Deploy Database Application (Individual), 40%. Examination, Final Exam (theory), 40%. Students must pass each assessment task as outlined to obtain a pass in a Unit of Study and be deemed competent.

JCB0101 BIOLOGY 1

Locations: Footscray Park.
Prerequisites: Nil.
Description: Biological Organisation, Macromolecules and Functional Group Chemistry (structure and form), Functioning Cells and organisation, Microscopy, Animal vs Plant Cell Structure,Endomembrane System, Organelles, Mitochondria vs Chloroplasts, Mitosis/Meiosis, Membranes: Fluid Mosaic Model, Passive Movement Across Membranes, Active Movement Across Membranes, Endo/Exo cytosis, Cellular Energetics: Oxidative Respiration; Energy Releasing Pathways and energy metabolism. Cell signalling and cell junctions, Structure and Function of the animal body, tissue types, organs and organ system, regulating body temperature and homeostasis, protection support and movement, epithelial covering, skeletal system, Neural Signalling; Sensory reception, Basic brain functions and parts, muscle contraction.
Credit Points:12
Class Contact:86 hours over the semester accounts for a mixture of lectures, tutorials and laboratory classes.
Required Reading: Solomon, E. P., Berg, L. R. & Tate, D.W. (2005) Biology, 7th edn. Brooks/Cole

JCB0102 BIOLOGY 2

Locations: Footscray Park.
Prerequisites:JCB0101 - BIOLOGY 1Or equivalent to be determined by Unit coordinator.
Description: Biological Classification; Plant biology form and function; Transport in Vascular plants, Photosynthesis. Angiosperm Reproduction, plant nutrition Ecology and Ecosystems.Genes, Chromosomes & DNA: Inheritance, Chromosome Structure, DNA Synthesis P & e, Genetic Code & Gene Expression: Transcription, Translation, Regulation, Manipulating Genomes: Genetic Engineering, Recombinant DNA Technology and applications, GE in Industry. Evolution.Organisation of vertebrate nervous system, Evolution of the vertebrate brain, The Central nervous system, Neural signalling and regulation, Peripheral nervous system, Receptors and their function, Internal Transport, Internal Defence, Gas Exchange, Processing Food & Nutrition, Osmoregulation & Disposal of Metabolic Wastes, Endocrine Regulation, Reproduction.
Credit Points:12
Class Contact:86 hours over the semester accounts for a mixture of lectures, tutorials and laboratory classes.
Required Reading: Solomon, E. P., Berg, L. R. & Tate, D.W. (2005) 7th edn. Biology Brooks/Cole

Assessment: Practical component is worth 15%. Problem based assignments are worth 10%. There will be three class tests worth 5% each. End of semester exam (3 hours) is worth 60%.

JCB0111 CHEMISTRY 1

Locations: Footscray Park.

Prerequisites: Nil

Description: Atomic Theory: including periodicity, electromagnetic radiation and excitation states. Quantization, line and continuous spectra. Electron arrangements and configurations Extension Studies in Dual nature of light including Einstein, de Broglie, Planck and Heisenberg Uncertainty Principle. Wave mechanical model of the atom. Effective nuclear charge.Bonding concepts Ionic, polar covalent and pure covalent bonding. Binary ionic compounds. Electronegativity and dipole moments, Hydrogen Bonding, Lewis structures, Electron and Molecular arrangements, Bond Angles, Octet and Duet rules- exceptions to these rules, VSEPR, Hybridization and the Localized Electron Model. Resonance and Formal charges Extension Studies in Covalent Bond Energies, Chemical complexes and ligands.Extension Studies in Molecular orbital theory and Bond Orders.Stoichiometry and Reactions. Atomic Masses. Mole concept, Empirical and Molecular formulas. Examining reaction types and their equation balancing. Calculations involving limiting reactions and % yields, percent compositions. Solution Chemistry including ppm, dilutions, precipitation reactions (including selective precipitation), molecular, ionic and net ionic equations, acid base reactions, conjugate acid base pairs. Intermolecular forces and dissociation. Back titrations. Spectrophotometric analysis and data acquisition from such analyses. Organic Chemistry, Nomenclature and reaction mechanisms Organic nomenclature (main functional groups). Isomerisation. Reaction types and introduction to reactivity. Extension Studies in chirality and enantioselectivity and mechanisms focussing on, alkanes, alkenes and carbonyl functional groups (eg hydrohalogenations, Aldol Condensations etc)Redox Reactions Oxidation states, half equations, redox titrations. Biological and industrial redox reactions. Extension Studies in Redox in Photography Gases Daltons, Boyles, Charles and Avogadro's laws. Ideal Gas Law. Kinetic molecular theory of gases. Effusion and diffusion. Gas stoichiometry, Extension studies in corrections for non ideal gases (real gases).Solution & Colligative Properties Solubility effects. Vapour Pressures of Solutions, Raults Rule, molality, Boiling-Point Elevation, Freezing-Point Depression and Osmotic Pressure. Extension studies in phase diagrams.Analysis - AAS and other spectrophotometric methods -standard preparation, calibration curves Extension Studies in NMR (Theory and application) proton NMR-proton environments, splitting patterns, coupling constants, electronegativity effects, functional group identification. Sample preparation.-IR (Theory and application) -functional group identification and utility in conjunction with NMR-.Errors in Analysis -examining errors in experimentation-statistical analysis

Credit Points: 12

Class Contact: 96 hours over the general semester accounts for a mixture of tutorials, laboratory classes and workshops. Additional 28 hours accounts for Extension Studies and their associated tutorials, problem based research projects and practicals.

Required Reading:

Assessment: Practical component is worth 15%. Extension Studies and associated exams and problem based enquiry/assignments are worth 18%. There will be three class tests worth 4% each. End of semester general exam (3 hours) is worth 55%. General exam and practical component must be passed for successful completion of subject.

JCB0112 CHEMISTRY 2

Locations: Footscray Park.

Prerequisites: JCB0111 - CHEMISTRY 1Or equivalent to be determined by Unit coordinator.

Description: Thermochemistry Enthalpy and calorimetry, heat capacities, Hess's Law, Standard Enthalpies of formation. Extension Studies : Automotive Chemistry. And the combustion engine Chemical Kinetics Reaction Rates, Rate Laws (0, 1st and 2nd order) half lives. Determining the Form of the Rate Law. The Integrated Rate Laws Reaction Mechanisms. Catalysis and enzymic action. Activation states and reaction types. Arrhenius Equation. Extension Studies in PharmakokineticsEquilibria (K and Q) Calculating chemical equilibria constants. Equilibrium Stoichiometry (solving for x). Equilibrium expressions involving pressures. Le Chatelier's Principle.Acid Base Equilibria pH scale, calculating pH of strong and weak acids and bases. Acid-base properties of salts. Acid/base stoichiometry and titrations. Solving acid-base equations.Aqueous Equilibria Acid and bases containing common ion, Buffered Solutions and capacity, pH curves. Solubility equilibria and solubility product (Ksp's). Acid-Base indicators. Extension Studies in Complex ion equilibria. Electrochemistry Galvanic Cells, Standard Reduction Potential, Nernst Equation. Cell Potential, Electrical Work, and Free Energy. Dependence of Cell Potential on Concentration, Batteries, Corrosion Electrolysis, Commercial Electrolytic Processes Standard reduction Potentials and galvanic cells,Nuclear Chemistry / Archaeological Chemistry Nuclear Stability and Radioactive Decay, The Kinetics of Radioactive Decay, Nuclear Transformations. Thermodynamic Stability of the Nucleus, Nuclear Fission and Nuclear Fusion. Detection and Uses of Radioactivity, Extension Studies in Archaeological Chemistry and Stella Nucleosynthesis.Organic Chemistry and Mechanisms,Further Organic synthesis and reaction types, Carbohydrates, lipids and Protein Chemistry. Enzymatic chemical reactions focusing on enantioselectivity and optical rotation. Extension Studies is Further mechanisms, including, reactions at the alpha carbon , Electrophilic Aromatic substitution, Effects of substituents on reactivity, radical chemistry and reactions of the main functional groups. Extension Studies in Analysis.-MS (Theory and application) -mass number identification and identification of main fragments (fragmentation mechanisms) -use in conjunction with NMR and IR -GC (Theory and application) - Operation and theory regarding retention times and separation. Quantitative applications. Column types, usage and instillation, understanding programming for analysis, detector systems (FID and ECD). Head space analysis and its application in forensics. GC/MS Hands on use and determining the effects of temp, pressure, length and type of column on retention times and base line separation. Column instillation and programming of ramping programs.

Credit Points: 12

Class Contact: 90 hours over the general semester accounts for a mixture of tutorials, laboratory classes and workshops. Additional 34 hours accounts for Extension Studies and their associated tutorials, problem based research projects and practicals.

Required Reading:

Assessment: Practical component is worth 16%. Extension Studies and associated exams and problem based enquiry/assignments are worth 20%. There will be three class tests worth 3% each. End of semester general exam (3 hours) is worth 55%. General exam and practical component must be passed for successful completion of subject.

JCM0101 INFORMATION TECHNOLOGY 1

Locations: Footscray Park.

Prerequisites: Nil.

Description: Journal Databases; Literature Searching and accessing using the Internet.Learning and utilising, WebCT, PowerPoint, Excel, Introduction to ChemDraw, DreamWeaver or alternative web development tool. Introductory Robotic Programming

Credit Points: 12

Class Contact:52 hours over the semester accounts for a mixture of lectures, tutorials and computer classes

Required Reading:

Assessment:A combination of assignments/presentation in each of the 4 areas chosen (25% each)contributes to overall mark which accumulates to 100%.

JCM0102 INFORMATION TECHNOLOGY 2

Locations: Footscray Park.

Prerequisites:

Description: Journal Databases; Literature Searching and accessing using the Internet.Learning and utilising, WebCT, PowerPoint, Excel, Introduction to ChemDraw, DreamWeaver or alternative web development tool. Introductory Robotic Programming

Credit Points:12

Class Contact:52 hours over the semester accounts for a mixture of lectures, tutorials and computer classes.

Required Reading: GraphPad Prism or SIGMA PLOT. Chem Draw Pro, Introduction to MathWork's MATLAB, Thomson ResearchSoft 's EndNote, Macromedia Director, Robotic Programming, MDSolids, Adobe Premier or alternative media authoring program.Students must complete four units to be eligible to complete JCM0102. Below is a guideline as to the units required for particular study pathways:Engineering: Introduction to MathWork's MATLAB, MDSolids, GraphPad Prism or SIGMA PLOT, Thomson ResearchSoft 's EndNote.Science/Health Science: Macromedia Director, GraphPad Prism or SIGMA PLOT, ChemDraw, Thomson ResearchSoft 's EndNote.

Assessment:A combination of assignments/presentation in each of the 4 areas chosen (25% each)contributes to overall mark which accumulates to 100%.

JCM0112 MATHEMATICS 1

Locations: Footscray Park.

Prerequisites: Nil.

Description: Numeracy: Advance Arithmetic and Fractions; Ratios, Percentages and Proportions; SI Units and Scientific NotationsMathematic Notation: Number Systems (Reals, Integers, etc); Domain and Range; Continuity; Functions and Relations; Basic Set Theory; Boolean AlgebraAlgebra: Basic Algebra; Binomial Expansion Theorem; Indices and Logarithms and their application to Science/EngineeringGraphing for Engineers: Linear Equations; Conic Sections; Trigonometric FunctionsGraphing for Scientists: Linear Equations; Quadratic Equations; Trigonometric FunctionsIntroductory Calculus: Limits; Differentiation; Anti-Differentiation and IntegrationApplications involving Calculus: Tangents and Normal Lines; Approximation; Curve Sketching (Cubic Functions); Maximum/Minimum Problems; Rates of ChangeStudents must complete four units to be eligible to complete JCM0112. Below is a guideline as to the units required for particular study pathways:Engineering: Algebra, Graphing for Engineers, Introductory Calculus, Applications involving Calculus.Science/Health Science (Mathematical): Algebra, Mathematical Notation, Graphing for Scientists, Introductory Calculus.Science/Health Science (Non Mathematical): Numeracy, Mathematical Notation, Algebra, Graphing for Scientists.

Credit Points:12

Class Contact:72 hours over the semester accounts for a mixture of lectures, tutorials and laboratory classes.

Required Reading: Nil.

Assessment: There will be three class tests worth 10% each. End of semester exam (3 hours) is worth 70%.

JCM0113 MATHEMATICS 2

Locations: Footscray Park.

Prerequisites:JCM0112 Mathematics 1

Description: Matrices, Simultaneous Equations, Univariate Statistics, Bivariate Statistics, Set Theory, Introduction to Probability, Combinatorics, The Normal Distribution.

Credit Points:12

Class Contact:72 hours over the semester accounts for a mixture of lectures, tutorials and laboratory classes.

Required Reading: Nil.

Assessment: There will be three class tests worth 10% each. End of semester exam (3 hours) is worth 70%.

JHL0110 ENGLISH LANGUAGE & COMMUNICATIONS SKILLS A

Locations: Footscray Park.

Prerequisites: Nil

Description: Communications skills that encompass synthesis, summarising, referencing, report writing, literature review writing and essay writing are developed primarily but not exclusively through a scientific context, Presenting ideas and concepts in ways other than in the written and verbal form will be examined and developed as will aspects of science journalism and science media. Debating and communicating with and for a variety of audiences will be developed as will presentations skills for academic purposes. Students will be engaged in teaching and communicating science to Primary/Secondary school students via the Professor Science show, producing science resources for teachers, parents and students alike. Students will also be engaged in two of several possible projects that are problem based and/or community based that will further foster communication skills.

Credit Points:12

Class Contact:62 hours over the semester accounts for a mixture of tutorials, workshops and computer classes.

Required Reading:

Assessment: Exam comprises 50%, Problem based/Community based Projects comprise 20%, Assignments comprise 15%, Professor Science Show comprises 15%, All aspects of the course are required to be passed.

JSP0102 PHYSICS 1

Locations: Footscray Park.

Prerequisites: Nil.

Description: Measurement: Significant Figures, Scientific Notation, Standards of measurement, Unit Conversion, Dimensional Analysis. One-Dimensional Kinematics Position, Distance and Displacement; Average Speed and Velocity; Acceleration; Motion with constant acceleration; Applications of the Equations of Motion; Free Falling Objects Vectors: Scalars; Vector Components; Adding and Subtracting vectors; Position, Displacement, Velocity, and Acceleration Vectors, Relative Motion. Two Dimensional Kinematics: Motions in Two Dimensions, Introduction to Projectile Motion, Launch angles. Newton's Laws of Motion, Force and Mass; the three laws of motion; Forces in two dimensions. Frictional Forces, Strings and Springs; Translational Equilibrium, Circular Motion, Work and Kinetic Energy: Work done by constant force, Kinetic energy and work, work done by variable forces, power. Potential Energy and Conservative forces: potential Energy and work, conservation of mechanical energy. Linear momentum and collisions: Momentum and Newton's second Law, impulse, conservation of linear momentum, inelastic collisions, elastic collisions, centre of mass. Introductory statics. Rotational energy, Moment of Inertia, Torque (to be expanded upon alongside power in second semester, physics 2)

Credit Points:12

Class Contact:92 hours over the general semester accounts for a mixture of tutorials, laboratory classes and problem based work shops.

Required Reading:

Assessment: Three small class tests are worth 5% each. End of semester exam (3 hours) is worth 50%. Problem and Project Bases Projects and associated assignments and presentations are 35%. End of semester exam and all problem based projects must be passed to secure a pass in this subject.

JSP0103 PHYSICS 2

Locations: Footscray Park.

Prerequisites:JSP0102 - PHYSICS 1Or equivalent to be determined by Unit coordinator.

Description: Rotational Kinematics and Energy: Angular position and acceleration, rotational kinematics; connections between linear and rotational quantities, rolling motion, inertia, and conservation of energy. Rotational Dynamics and Static Equilibrium; Torque, angular acceleration and torque, centre of mass and balance; dynamic applications of torque, angular momentum, conservation of angular momentum, rotational work. Gravity: Newton's Law of Universal Gravitation. Gravitational attraction of spherical bodies: Gravitational potential energy; Energy conservation, Oscillations about equilibrium. Periodic motion; simple harmonic motion; uniform and simple harmonic motion connections, Energy conservation are oscillatory motion, damped oscillations, resonance. Waves and sound, wave types, waves on a string, harmonic wave functions, sound waves, sound intensity, Doppler effect, superposition and interference, standing waves, beats.Light and Sound: Reflection, refraction. Total internal reflection. Mirrors. Lenses and image formation. Waves on a string, sound waves, speed of sound, intensity and sound level, Doppler effect. Shock waves. Light as a wave, superposition, standing waves, interference and diffraction, polarisation.Electricity: Electrostatic charge, electric field, electric potential, dc circuits, Ohm's law, series and parallel resistors, Kirchoff's law, ac circuits, series and parallel capacitors, inductors. Continuation of statics. Fluids and Elasticity.

Credit Points:12

Class Contact:92 hours over the general semester accounts for a mixture of tutorials, laboratory classes and problem based work shops.

Required Reading:

Assessment: Three small class tests are worth 4% each. End of semester exam (3 hours) is worth 50%. Problem and Project Bases Projects and associated assignments and presentations are 38%. End of semester exam and all problem based projects must be passed to secure a pass in this subject.

LGAPLEM502A APPLY ECOLOGICALLY SUSTAINABLE DEVELOPMENT PRINCIPLES TO THE BUILT ENVIRONMENT

Locations: Sunshine.

Prerequisites: Nil.

Description: Identify and gather data on the application of ecologically sustainable development principles to the built environment; Develop strategies for the application of ecologically sustainable development principles to the built environment; Develop plan to apply ecologically sustainable development principles to the built environment; Monitor and review strategies for the application of ecologically sustainable development principles to the built environment.

Required Reading:-

Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and RTO/workplace assignments.

LGAWORK404A MANAGE A CIVIL WORKS PROJECT

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit covers managing a civil works project within council areas. The unit addresses all aspects of planning, implementing and monitoring a civil works project through to completion, including the documentation required to support the project.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

MEM09157A PERFORM MECHANICAL ENGINEERING DESIGN DRAFTING

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency covers the preparation of design drawings or graphics used in the mechanical engineering, manufacturing engineering and related industry sectors. The unit includes working with a design brief or concept prepared by an engineer or other designer as well as the specification of items, functions, limits, fits, tolerances, and other engineering information required for the eventual production of fully detailed drawings. The unit requires the design drawing to be performed using appropriate computer-aided design (CAD) and other drafting techniques that include sketching, computer graphics and the application of drawing standards.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently: - select and apply design criteria to meet requirements of the deign brief - review features, functions and context of engineering drawings - develop orthographic, isometric and other 3-D graphical representations - represent mechanical components and assemblies using sketching and computer graphics - represent mechanical components and features using a comprehensive range of standard conventions and graphical techniques - represent a range of mechanical assemblies using standard graphical representations - recognise when to engage appropriate licensed technical and professional assistance for advice - provide documentation, images and files.

MEM13013B WORK SAFELY WITH IONIZING RADIATION

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit covers working safely with ionizing radiation when performing radiographic testing in a range of industrial applications.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

MEM22015A SOURCE AND ESTIMATE ENGINEERING MATERIALS REQUIREMENTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency covers the skills and knowledge required to locate and approve a materials source and estimate materials requirements against a specification or bill of materials for engineering-related operations. This includes consideration of quantities, quality and capacity of suppliers to supply in accordance with a supply plan.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently: - plan for materials resourcing - estimate quantities, source and evaluate materials suppliers - develop tender and contract documents, materials requirement and purchasing schedule, purchasing budgets, and performance indices for materials supply chain - participate, communicate, cooperate, and negotiate with stakeholders on policy and procedures development and implementation - monitor supply of materials against contract requirements and key performance indicators (KPIs) - contribute to organisational management processes, and materials supply chain management.

MEM22017A COORDINATE CONTINUOUS IMPROVEMENT AND TECHNICAL DEVELOPMENT

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency covers the skills and knowledge required to coordinate continuous improvement and ongoing technical development activities for engineering-related operations or projects. It includes feasibility studies, proposals for the introduction of technology or process change and development of implementation strategy, costing and budgets relating to proposals

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently: - evaluate technologies, assets, workforce and contractor skills and knowledge, personnel development strategies, hardware and software technology requirements, for technology and capability gaps and opportunities for improvement - review organisation structure, current operations and context, development opportunities, budgets and constraints, software options for opportunities for improvement - complete feasibility analyses on options and develop proposals - maintain appropriate documentation and records - demonstrate systems thinking, constraints and contingency management, short-term planning adjustments and rescheduling - manage physical and financial resources and budget within delegation - communicate and negotiate with stakeholders - report and document progress and results, data and analysis in accordance with procedures.

MEM22018A COORDINATE SALES AND PROMOTION OF ENGINEERING-RELATED PRODUCTS OR SERVICES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency covers the skills and knowledge required to coordinate sales and promotion of engineering-related products or services requiring engineering knowledge. The unit covers ensuring appropriate technical advice is provided to clients, contribution and participation in strategic planning and sales budget setting, control of sales costs against budgets, and responsibility for meeting sales performance indices. It includes a requirement to provide feedback on customer satisfaction and seek out opportunities for improvements.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently: - define sales and marketing organisational mission and strategic objectives, features and functions within the organisation - plan, schedule and budget to achieve promotional and sales objectives - identify technical and market advantage for products or services, customer-supplier relationships, current markets and context, marketing and sales opportunities, and constraints - investigate and evaluate options for sales, promotions and marketing team development, and complete feasibility analysis on marketing options - maintain records of plans, priorities, schedules and progress, legislative compliance, and personal and team skills development - coordinate implementation of objectives, sales, marketing and promotions, personal and team training, continuous improvement, problem solving and decision making, systems thinking, constraints and contingency management, short-term planning adjustments and rescheduling, and marketing team resources and budget - communicate and negotiate with stakeholders monitor products and services - report and document progress and results, data and analysis in accordance with procedures.

MEM23002A APPLY CALCULUS IN ENGINEERING SITUATIONS

Prerequisites: Nil.

Description: This unit covers applying concepts of calculus to engineering situations.

Assessment: The critical aspects for assessment and evidence required to demonstrate competency in this unit is proof that the learner has the ability to solve engineering problems using the principles of differentiation; obtain first and second derivatives of algebraic, trigonometric, exponential and logarithmic functions; obtain integrals of algebraic, trigonometric and exponential functions; evaluating definite integrals; solve engineering problems using the principles of integration. The anticipated methods of assessment will be diagrams and models created by the learner; practical demonstration; records of teacher observations of learner's activities, discussions and practical tasks; self-assessment sheets and online responses; written and verbal reports of investigations and problem-solving activities.

MEM23004A APPLY TECHNICAL MATHEMATICS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency covers the application of mathematical analysis, graphical and software techniques to engineering problems. It includes exponential and logarithmic functions, trigonometric equations involving single and double angles, sequences and series, two dimensional vector analysis, complex numbers, determinants and matrices.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently: - solve mathematical problems using software - validate software results of simple examples analytically and/or graphically - manipulate values using decimal, binary and hexadecimal number systems - graph and analyse exponential, logarithmic and trigonometric functions for solutions - use the techniques of sequences and series to solve simple mathematical problems - use the techniques of two dimensional vectors to solve mathematic and applied problems - solve problems involving complex quantities using the properties, operations and theorems of complex numbers - use determinant and matrix analysis to solve algebraic and vectorial problems - use probability to assess likely occurrences.

MEM23007A APPLY CALCULUS TO ENGINEERING TASKS

Locations: Industry, Sunshine.

Prerequisites: MEM23004A - APPLY TECHNICAL MATHEMATICS

Description: This unit of competency covers the application of calculus, including differentiation and integration techniques to engineering applications. It includes the use and application of standard differentiation and integration rules, finding maximum and minimum values of curves, application to rates of change and slope, finding definite integrals, using method of substitution, using trigonometric identities and finding areas under curves.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently: - solve mathematical problems related to engineering and manufacturing using calculus techniques - validate results of mathematical problems using calculus either analytically and/or graphically - manipulate engineering and manufacturing-related mathematical functions and equations using calculus techniques - analyse mathematical problems by using appropriate calculus techniques to achieve engineering and manufacturing solutions.

MEM23109A APPLY ENGINEERING MECHANICS PRINCIPLES

Locations: Industry, Sunshine.

Prerequisites:MEM23004A - APPLY TECHNICAL MATHEMATICS

Description: This unit of competency covers the application of mechanics and strength of materials principles to devices, machines and systems and their components in order to identify key mechanical properties. It includes a range of basic analyses of static and dynamic loads and moments, stresses and deflections, velocities and accelerations.

Required Reading: Refer to Learning and Assessment Plan

Assessment:- This unit may be assessed on the job, off the job or a combination of both on and off the job. Where assessment occurs off the job then a simulated working environment must be used where the range of conditions reflects realistic workplace situations. The competencies covered by this unit would be demonstrated by an individual working alone or as part of a team. - Where applicable, reasonable adjustment must be made to work environments and training situations to accommodate ethnicity, age, gender, demographics and disability. - Access must be provided to appropriate learning and/or assessment support when required. Where applicable, physical resources should include equipment modified for people with disabilities.

MEM23111A SELECT ELECTRICAL EQUIPMENT AND COMPONENTS FOR ENGINEERING APPLICATIONS

Locations: Industry, Sunshine.

Prerequisites:MEM23004A - APPLY TECHNICAL MATHEMATICS

Description: This unit of competency covers the identification and matching of electrical supply and electrical system equipment and components to mechanical, manufacturing and mechatronic engineering applications. It includes electrical principles and laws, inductive and capacitive effects on AC supplies, control system power supply fundamentals, electrical safety and earthing systems, electrical motors and motor controls.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently: - identify effects and dangers of electricity - review sustainability implications, functions and features of electrical devices, machines and systems - assess and apply basic electrical principles and techniques - evaluate of suitability of electric power supply for applications - apply appropriate calculations and methods for electric motor control - ensure safe electrical working practice and compatibility of units in calculations - report and document results.

MEM30031A OPERATE COMPUTER-AIDED DESIGN (CAD) SYSTEM TO PRODUCE BASIC DRAWING ELEMENTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency covers the skills and knowledge required to apply functions of computer-aided design (CAD) software programs that are typically used in the production of detail drawings.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Specifically the candidate must be able to: - work within typical site/teamwork structures and methods - apply worksite communication procedures - comply with organisational policies and procedures, including quality requirements - participate in work meetings - comply with quality requirements - use industry terminology - apply appropriate safety procedures - identify drawing work requirements and determine appropriate software functions and features - identify features and uses of CAD software used in detail and design drafting - access and use computing equipment and CAD software functions to produce drawing elements.

MEM30033A USE COMPUTER-AIDED DESIGN (CAD) TO CREATE AND DISPLAY 3-D MODELS

Locations: Industry, Sunshine.

Prerequisites:MEM30031A - OPERATE COMPUTER-AIDED DESIGN (CAD) SYSTEM TO PRODUCE BASIC DRAWING ELEMENTS

Description: This unit of competency covers using a computer-aided design (CAD) program to produce and plot basic 3-D view drawings.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and be capable of applying the competency in new and different situations and contexts. Specifically the candidate must be able to: - work within typical site/teamwork structures and methods - apply worksite communication procedures - comply with organisational policies and procedures, including quality requirements - participate in work meetings - comply with quality requirements - use industry terminology - apply appropriate safety procedures - identify modelling work requirements and determine appropriate software functions and features - apply CAD functions to produce a rendered 3-D model to Australian Standard (AS) 1100.101-1992 Technical drawing - General principles.

MSACMC610A MANAGE RELATIONSHIPS WITH NON-CUSTOMER EXTERNAL ORGANISATIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit is focused on the skills needed to identify and manage relationships with non-customer external organisations such as community groups, other businesses, training providers, research organisations and government departments.

Required Reading: Liker K Jeffrey 2005 The Toyota Way McGraw-Hill

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

MSAPMSUP400A DEVELOP AND MONITOR QUALITY SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This competency covers the establishment, maintenance and evaluation of quality systems for a complete production area and/or plant.

Required Reading: Refer to Learning and Assessment Plan

Assessment: It is essential that competence is demonstrated in the knowledge and skills defined in this unit. These may include the ability to: - effectively maintain and evaluate quality systems carried out - implement relevant staff training programs - produce adequate quality documentation including policies and procedures. Consistent performance should be demonstrated. For example, look to see that: - the development, implementation and evaluation of the quality system runs smoothly - all safety procedures are always followed.

MSL922001A RECORD AND PRESENT DATA

Locations: Werribee, Industry, City Flinders, St Albans.

Prerequisites: Nil.

Description: This unit of competency covers the ability to record and store data, perform simple calculations of scientific quantities and present information in tables and graphs. The unit of competency requires personnel to solve predictable problems using clear information or known solutions. Where alternatives exist, they are limited or apparent.

Required Reading: No required text

Assessment: Assessment may include: Practical assessment; assignment; workplace projects.

MSL924001A PROCESS AND INTERPRET DATA

Locations: Footscray Nicholson, Werribee, Footscray Park.

Prerequisites: Nil.

Description: This unit of competency covers the ability to retrieve data, evaluate formulae and perform scientific calculations, present and interpret information in tables and graphs and keep accurate records. The unit requires personnel to solve problems of limited complexity where the information may be less obvious, but not contradictory, and can be determined by direct reasoning.

Required Reading: No required text

Assessment: Diploma of Animal Technology: Graded - Written questions, written tests, assignments, worksheets. Assessment may include: Practical assessment, tests, workplace projects, demonstration, written and verbal tasks

MSL973004A PERFORM ASEPTIC TECHNIQUES

Locations: Footscray Nicholson, Werribee.

Prerequisites: Nil.

Description: This unit of competency covers the ability to perform aseptic techniques to maintain the integrity of both the sample source and the sample. It applies to sampling techniques in tissue culture and to generic microbiological procedures.

Required Reading: No required text

Assessment: Diploma of Animal Technology: Graded - Practical observation, written tests, assignments Assessment may include: Practical assessment, tests, workplace projects, demonstration written and verbal tasks

MSL974011A PREPARE TISSUE AND CELL CULTURES

Locations: Werribee, Industry.

Prerequisites: MSL973007A - PERFORM MICROSCOPIC EXAMINATION

Description: This unit of competency covers the ability to prepare primary tissue cultures for applications, such as maintenance of animal cell lines and propagation of plants by tissue culture and basic subculture procedures. Personnel are required to manipulate equipment and materials and samples to prevent contamination at all preparation stages. They will have ready access to enterprise procedures and will work under direct supervision.

Required Reading: No required text

Assessment: Diploma of Animal Technology: Graded - Practical observation, written questions, assignments. Assessment may include: Practical assessment; written and verbal tests, workplace projects, demonstration,

MTMPS5603B DEVELOP, MANAGE AND MAINTAIN QUALITY SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the skills and knowledge required to establish, maintain and control an enterprise quality system. It also covers the skills and knowledge needed to lead people, manage systems and build quality into all enterprise systems and operations. The development and management of quality systems affects the ability of the enterprise to operate in specific markets and influences customer and consumer confidence in enterprise products.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Competency must be demonstrated through sustained performance over time, at an appropriate level of responsibility and authority under typical operating and production conditions for the enterprise.

NWP219A WORK SAFELY IN CONFINED SPACES

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to work safely in confined spaces in the water industry. Working in confined spaces poses specific health and safety risks and the ability to follow defined workplace policies and procedures, OHS policies and procedures and regulatory requirements are essential for safe practice.

Required Reading: VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP300B PROVIDE AND PROMOTE CUSTOMER SERVICE

Locations: Footscray Nicholson.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to respond effectively to the needs of internal and external customers by applying organisational standards and processes. The ability to solve problems, communicate effectively and seek opportunities to improve service to customers is essential to performance.

Required Reading: Nil

Assessment: Assessment for this unit will be related to that of NWP303. With specific parts relating to adequately servicing the customer in the resolution of environmental issues. In additon learners willbe expected to undergoe reflective journaling via the use of e portfolios relating to external and internal customer issues in other units such as NWP345, NWP346, NWP360 and NWP363. Acceptable recognition evidence may include the learner's position description validated by the workplace supervisor stating that acceptable customer service is provided by the learner.

NWP315B INVESTIGATE AND REPORT BREACHES OF WATER INDUSTRY LEGISLATION

Locations: Sunshine.

Prerequisites: There are No Pre-requisite Units for this Unit Version

Description: This unit of competency describes the outcomes required to investigate breaches of legislation relevant to the water industry, including conducting interviews and preparing reports for use in court proceedings.

Required Reading:VU Produced Workbook

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP401B COORDINATE AND MONITOR THE APPLICATION OF ENVIRONMENTAL PLANS AND PROCEDURES

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor the application of environmental plans and procedures to specific projects and to develop environmental procedures for the local work area.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP410B COORDINATE AND MONITOR ASSET CONSTRUCTION AND MAINTENANCE

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor asset construction and maintenance, including site management and associated commissioning and post-commissioning activities.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP415B COORDINATE AND MONITOR SURFACE WATER SYSTEMS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor the operation of surface water systems, ensuring that surface water management plan (SWMP) performance measures are met, environmental issues are addressed and a source of supply is maintained.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP416B COORDINATE AND MONITOR WATER STORAGE CATCHMENT ACTIVITIES

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor activities in water storage catchments that affect water yield and quality.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP417B COORDINATE AND MONITOR GROUNDWATER SYSTEM USAGE

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor the use of groundwater as a source of water supply, ensuring that groundwater management plan (GWMP) performance measures are met, environmental issues are addressed and source of supply is maintained.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP418B COORDINATE AND MONITOR BULKWATER SYSTEM OPERATIONS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to monitor and coordinate the operation of bulkwater systems and to measure and report on system performance and process quality control.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP419B COORDINATE AND MONITOR RIVER SYSTEM USAGE

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to monitor and coordinate the operation of river systems and measure and report on river flows, including flood plains and the river environment.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP425B COORDINATE AND MONITOR THE OPERATION OF IRRIGATION DELIVERY SYSTEMS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor irrigation delivery systems to ensure system maintenance and performance standards.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP426B COORDINATE AND MONITOR THE OPERATION OF POTABLE WATER SYSTEMS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor system performance, maintenance planning and customer liaison in potable water distribution systems.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP427B COORDINATE AND MONITOR THE OPERATION OF DRAINAGE SYSTEMS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor drainage systems to ensure compliance with the drainage system management plan, including system performance, maintenance planning and customer liaison.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP428B COORDINATE AND MONITOR THE OPERATION OF WASTEWATER COLLECTION SYSTEMS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate and monitor wastewater collection networks to ensure system performance, planning and maintenance conform to targets outlined in the wastewater system management plan.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP429B COORDINATE, IMPLEMENT AND REPORT TRADE WASTE MONITORING PROCEDURES

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate, implement and report on monitoring programs for trade waste treatment and disposal in commercial and light industrial organisations; and to implement the monitoring of complex trade waste systems in large organisations.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP430A EVALUATE, IMPLEMENT AND MONITOR STANDARD LOW-RISK TRADE WASTE DISCHARGE APPROVALS

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to assess and process applications for standard low-risk trade waste discharges from commercial and light industrial organisations; monitor compliance with the trade waste approval issued; and renew, amend, suspend or revoke trade waste discharge approvals as appropriate.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP431A INVESTIGATE, RECTIFY AND REPORT ON TRADE WASTE

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to investigate trade waste incidents, make arrangements for rectification and complete reports.

Required Reading:VU VU produced workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP435B COORDINATE AND MONITOR THE OPTIMISATION OF WATER TREATMENT PROCESSES

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to coordinate, monitor, operate and report on water treatment plant system performance and

process quality control to investigate, test and implement optimisation strategies.
Required Reading:VU VU produced workbooks
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP436B COORDINATE AND MONITOR THE OPTIMISATION OF WASTEWATER TREATMENT PROCESSES

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency describes the outcomes required to coordinate, monitor, operate and report on wastewater treatment plant system performance and process quality control to investigate, test and implement optimisation strategies.
Required Reading:VU VU produced workbooks
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP437A ANALYSE DATA AND PRODUCE HYDROMETRIC REPORTS

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency describes the outcomes required to analyse and verify data and produce hydrometric data reports to support organisational decision making. An understanding of the processes required to interpret data, verify data and produce clear reports that conform to organisational standards is essential to performance.
Required Reading:VU VU produced workbooks
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP438A MEASURE AND PROCESS HYDROMETRIC STREAM DISCHARGE DATA IN FLOOD CONDITIONS

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency describes the outcomes required to collect hydrometric stream gauging data in flood conditions. An understanding of risk assessment and of factors affecting the accuracy and precision of the areavelocity method is essential to performance.
Required Reading:VU VU produced workbooks
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP440A SUPERVISE CONDUIT INSPECTION AND REPORTING

Locations: Sunshine.
Prerequisites: Nil.
Description: This unit of competency describes the outcomes required to supervise or manage the inspection and reporting of the condition and features in sewer and stormwater conduits using specialised closed circuit television (CCTV) equipment.
Required Reading:VU VU produced workbooks
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP525B IMPLEMENT AND MANAGE ASSET CONSTRUCTION AND MAINTENANCE

Locations: Sunshine.
Prerequisites: There are No Pre-requisite Units for this Unit Version
Description: This unit of competency describes the outcomes required to implement and manage asset construction and maintenance projects. This requires the ability to conduct often complex planning of activities including the scheduling and resourcing of projects and the monitoring of the project to ensure the completion of the work in line with the organisation's requirements and to the required quality.
Required Reading:VU Produced Workbook
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

NWP551A EVALUATE, IMPLEMENT AND MONITOR HIGH-RISK TRADE WASTE DISCHARGE

Locations: Sunshine.
Prerequisites: There are No Pre-requisite Units for this Unit Version
Description: This unit of competency describes the outcomes required to implement and manage asset construction and maintenance projects. This requires the ability to conduct often complex planning of activities including the scheduling and resourcing of projects and the monitoring of the project to ensure the completion of the work in line with the organisation's requirements and to the required quality.
Required Reading:VU Produced Workbook
Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

PRSSM504A PREPARE SECURITY RISK MANAGEMENT PLAN

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: Evaluate and prioritise risks;Develop action plans;Identify management requirements;Design treatment options;Develop risk management plan.
Required Reading:-
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

PRSTS301A IDENTIFY TECHNICAL SECURITY REQUIREMENTS

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.

Description: Prepare to identify security requirements; Identify security requirements; Document security requirements.
Required Reading: -
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

PSPPM601B DIRECT COMPLEX PROJECT ACTIVITIES

Locations: Footscray Nicholson, Werribee, Sunshine, St Albans.
Prerequisites: Nil.
Description: Identify project scope in a strategic context;Manage establishment of projects;Manage integration of project activities;Finalise and review project activities.
Required Reading: -
Assessment: One or more of the following: written assignment, written test, simulation, observation, demonstration, discussion, questioning, presentation, campus/workplace projects and workplace assignments.

PSPPROC503B MANAGE CONTRACT PERFORMANCE

Locations: Werribee, Industry, Footscray Park.
Prerequisites: Nil.
Description: This unit covers the competency required by people whose primary role is contract management to implement strategies that ensure effective contract performance. It includes managing the business relationship, performance of the contract, and contract issues; and implementing a communication strategy. In practice, managing contract performance may overlap with other public sector and local government generalist and specialist work activities, such as promoting the values and ethos of public service or local government, undertaking negotiations, promoting compliance with legislation in the public sector, finalising contracts, managing procurement risk, planning to manage a contract, planning for procurement outcomes and making procurement decisions.
Required Reading: VU Produced Workbooks
Assessment: This unit includes LiWC and will be assessed by demonstration and observation and/or portfolio of evidence.

PSPPROC504B FINALISE CONTRACTS

Locations: Footscray Nicholson, Werribee, Industry.
Prerequisites: Nil.
Description: This unit covers the ability to finalise processes for contracts. It includes completing contracts and implementing a contract review strategy. In practice, finalising contracts may overlap with other public sector generalist and specialist work activities, such as promoting the values and ethos of public service and local government, undertaking negotiations, promoting compliance with legislation in the public sector or local government, managing contract performance, managing procurement risk, planning to manage a contract, planning for procurement outcomes and making procurement decisions.
Required Reading: VU Produced Workbooks
Assessment: This unit includes LiWC and will be assessed by demonstration and observation and/or portfolio of evidence.

PSPPROC505A MANAGE PROCUREMENT RISK

Locations: Footscray Nicholson, Werribee, Industry.
Prerequisites: Nil.
Description: This unit covers the ability to manage risks associated with all stages of procurement. It includes assessing risk, and preparing, implementing and reviewing a risk management plan. In practice, managing procurement risk may overlap with other public sector and local government generalist and specialist work activities, such as promoting the values and ethos of public service or local government, undertaking negotiations, promoting compliance with legislation in the public sector, managing contract performance, finalising contracts, planning to manage a contract, planning for procurement outcomes and making procurement decisions.
Required Reading: VU Produced Workbooks
Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

PSPPROC506A PLAN TO MANAGE A CONTRACT

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit covers the ability to establish arrangements for contract management. It includes confirming contract requirements, preparing a contract management plan, and implementing contract strategies and contractual arrangements. In practice, planning to manage a contract may overlap with other public sector and local government generalist and specialist work activities, such as promoting the values and ethos of public service or local government, undertaking negotiations, promoting compliance with legislation in the public sector, managing contract performance, finalising contracts, managing procurement risk, planning for procurement outcomes and making procurement decisions.
Required Reading: Not applicable
Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study. Assessments may include: Practical assessment, work projects, demonstration, written and verbal tasks.

PSPPROC507A PLAN FOR PROCUREMENT OUTCOMES

Locations: Footscray Nicholson, Werribee, Industry.
Prerequisites: Nil.
Description: This unit covers advanced planning for complex procurement within established guidelines, policies and procedures. It includes applying and managing procurement governance arrangements, developing procurement and market strategies, and undertaking analysis to support achievement of procurement outcomes through definition of requirements aligned to business needs, consultation with stakeholders, establishment of tender evaluation panels, and documentation of detailed procurement planning. In practice, planning for procurement outcomes may overlap with other public sector and local government generalist and specialist work activities, such as acting ethically, complying with legislation, providing client service, providing leadership, developing policy, and undertaking negotiations.
Required Reading: VU Produced Workbooks
Assessment: This unit includes LiWC and will be assessed by demonstration and observation and/or portfolio of evidence.

PSPPROC508A MAKE PROCUREMENT DECISIONS

Locations: Footscray Nicholson, Werribee, Industry.
Prerequisites: Nil.
Description: This unit covers advanced decision making for complex procurement within established guidelines, policies and procedures. It includes understanding and applying legal and policy obligations in addition to the other factors that may influence decisions when selecting effective procurement methods, and undertaking contractual arrangements and supplier choice in an accountable and transparent environment. In practice, making procurement decisions may overlap with other public sector and local government generalist and specialist work activities, such as acting ethically, complying with legislation, providing client service, providing

leadership, developing policy, and undertaking negotiations.
Required Reading:VU Produced Workbooks
Assessment: This unit includes LiWC and will be assessed by demonstration and observation and/or portfolio of evidence.

PSPPROC509A PARTICIPATE IN BUDGET AND PROCUREMENT REVIEW PROCESSES

Locations: Footscray Nicholson, Werribee, Industry.
Prerequisites: Nil.
Description: This unit covers the ability to participate in government budget and review processes to ensure that procurement and contract management activities occur within established procedures and financial obligations are fulfilled. It covers the budget cycle, the procedures for obtaining funding for procurement exercises, the obligations organisations have in relation to spending and the review and audit procedures that may apply to procurements and contract management. In practice, participating in budget and procurement review processes may overlap with other public sector and local government generalist and specialist work activities, such as promoting the values and ethos of public service, undertaking negotiations, promoting compliance with legislation in the public sector or local government, managing contract performance, finalising contracts, managing procurement risk, planning to manage a contract, planning for procurement outcomes and making procurement decisions.
Required Reading:VU Produced Workbooks
Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

PSPPROC510A CONDUCT AND MANAGE COORDINATED PROCUREMENT

Locations: Footscray Nicholson, Werribee, Industry.
Prerequisites: Nil.
Description: This unit covers the ability to use existing coordinated procurement contracts (CPCs) and cooperative procurement arrangements (CPAs), and to establish new CPAs across agencies. It includes identifying existing CPCs and CPAs; understanding the processes of existing contracts and arrangements; and planning, developing and implementing new CPAs. In practice, using coordinated, cooperative procurements may overlap with other public sector and local government generalist and specialist work activities, such as managing policy implementation, applying government processes, managing complex projects, planning for strategic procurement, negotiating strategic procurement, and establishing contract management arrangements.
Required Reading:VU Produced Workbooks
Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

RBF1150 GLOBAL ENVIRONMENTAL ISSUES

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit highlights the various aspects of science through the use of practical and theoretical case studies. The unit concentrates on the pure and applied sciences and their relevance and applications to historical and contemporary global environmental issues. Students will be required to explore areas such as population regulation in key emerging economies; population growth momentum; environmental history and spectrum of environmental thought; environmental groups and their work; connections amongst social justice and environmental issues (eg., education levels, status of women, human rights, relative wealth); resource consumption, pollution and renewables in developing and developed countries; deforestation and biodiversity loss; water and soil resources; food production, biotechnology and appropriate agricultures; energy resources; chemical cycles including the greenhouse effect and ozone depletion; the roles of mathematics, physics, chemistry, biology, ecology and computing in global environmental issues. Topics will be developed within the context of risk management and ethical and moral frameworks.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- explain the interconnectedness amongst 'things' and 'actions';
- define terms commonly used in global environmental issues;
- discuss the breadth of coverage of subjects contributing to an appreciation of environmental issues;
- discuss the connections amongst actions and lifestyles in developed and less-developed countries;
- develop a sense of self-confidence in presentation of their ideas and tolerance toward others and the ideas of others;
- debate a variety of environmental issues; and
- critically examine their own life in relation to various environmental issues.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and tutorials.
Required Reading: Miller, G. T. (2002). Living in the environment (15th ed.). Belmont: Wadsworth.
Assessment: Case Study, Case Study and Assignments, 50%. Examination, Written, 50%. In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. .

RBF1160 AUSTRALIAN LANDSCAPES AND BIOTA

Locations: Werribee.
Prerequisites: Nil.
Description: This unit introduces students to both the range of environments and landscapes present across the Australian continent and the nature of the plants and animals that inhabit these landscapes. This will be achieved by: 1) discussing the factors that have shaped the various Australian environments, including geomorphological and climatic processes, and historical factors; 2) introducing the distinctive flora and fauna of Australia and the evolutionary pressures that have shaped the Australian biota; and 3) reviewing relationships between the biota and the environment. The unit also provides foundational knowledge on the Australian environment for students not continuing in the biological sciences.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Describe factors that have shaped various Australian environments, including geomorphological, climatic, historical and evolutionary;
- Explain the relationships between the biota and the environment;
- Use a limited range of practical skills appropriate to the field;
- Produce written tasks indicating critical thinking and basic research skills.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and a series of all-day field trips.
Required Reading: De Blij, H. J., & Muller, P. O. (1993). Physical geography of the global environment. Canada: Wiley.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Other, Field Work Reports, 40%. Assignment, Assignments, 20%. Examination, Examination, 40%.

RBF1310 BIOLOGY 1

Locations: Footscray Park, St Albans.
Prerequisites: Nil.
Description: This unit introduces students to the structure and function of living organisms, with an emphasis on animals. Topics covered include cell biology; internal transport mechanisms; sensory systems; gas exchange systems; digestive systems; support and movement; defence against pathogens; and homeostasis.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify major organelles and structures in a typical cell;
- Use a microscope in a laboratory setting;
- Describe the relationship between surface area and volume in a cell and explain its significance in biological systems;
- Describe processes in major organ systems;
- Identify key structures of the mammalian heart and eye;
- Gather and interpret data in a laboratory setting.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures and practical classes.
Required Reading: Knox, R. B., Ladiges, P., Evans, B., & Saint, R. (2005). Biology: An Australian focus (3rd ed.). Roseville, NSW: McGraw-Hill or Solomon, E., Berg, L., & Martin, D. W. (2007). Biology (8th ed.). Brooks Cole.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Essay, Essay, 10%. Other, Practical Work, 30%. Examination, Written, 60%.

RBF1320 BIOLOGY 2

Locations: Footscray Park, St Albans.
Prerequisites: Nil.
Description: This unit complements material covered in RBF1310 Biology 1. Topics covered include structure and function of plants; photosynthesis and cell respiration; the cell cycle; principles of genetics; evolution and biodiversity; and basic population and community ecology.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify structures and major cell types in flowering plants;
- Describe the flow of water and nutrients through the vascular system of a flowering plant;
- Construct and use a simple dichotomous key;
- Compare and contrast the effects of genetic drift and selection on populations;
- Perform and write up experiments in laboratory settings.

Class Contact: Sixty (60) hours or equivalent for one semester comprising lectures and practical classes.
Required Reading: Knox, R. B., Ladiges, P., Evans, B., & Saint, R. (2005). Biology: An Australian focus (3rd ed.). Roseville, NSW: McGraw-Hill or Solomon, E., Berg, L., & Martin, D. W. (2007). Biology (8th ed.). Brooks Cole.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed Essay, Essay, 10%. Other, Practical work, 30%. Examination, Written examination, 60%.

RBF2243 FOOD PROCESSING OPERATIONS

Locations: Werribee.
Prerequisites:RBF1140 - INTRODUCTION TO FOOD, NUTRITION AND HEALTH 1
Description:A basic introduction to unit operations. Preservation by moisture control: water activity, intermediate moisture foods, concentration, dehydration and freeze drying. Preservation by heat treatment: pasteurisation, sterilisation, canning. Preservation by chilling and freezing. Chemical preservation and fermentation. Preservation by irradiation. Modified atmospheres. Influence of processing on product safety, quality and nutritional value of food. Principles of food packaging, packaging requirements.

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Discuss different methods of spoilage of various food groups;
- Explain different methods of preservation and fermentation;
- Suggest appropriate methods of preservation including the concept of hurdles to control a given deterioration;
- Describe the issues associated with food packaging.

Class Contact: Seventy-two (72) hours or equivalent for one semester comprising lectures and tutorials.
Required Reading: Toledo, R. T. (2007). Fundamentals of food process engineering (3rd ed.). New York: Springer.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Assignment, Assignments , 40%. Examination, Final open-book examination, 60%.

RBF2300 MICROBIOLOGY 1

Locations: Werribee.
Prerequisites:RBF1310 Biology 1.
Description: Introduction to the biology of bacteria, protozoans, fungi and viruses. Microbial cell morphology; structure and function of cell components. Growth, reproduction and enumeration of micro-organisms. Control of microbial growth: the effect of physical and chemical environments on growth. Microbial metabolism and genetics.
Credit Points:12
Class Contact: Five hours per week comprising three hours of lectures per week and eight three hour laboratory classes during the semester.
Required Reading: To be advised by lecturer.
Assessment: Assignment, 20%; practical work, 25%; examination, 55%.

RBF2330 CELL BIOLOGY

Locations: Werribee, St Albans.

Prerequisites:RBF1310 Biology 1 or RBM1528 Human Physiology 2.
Description: This unit provides a strong foundation for students moving into areas such as: biotechnology, molecular biology, medical sciences and environmental sciences. Topics include: Eukaryotic cell organisation (covering all of the major organelles) and compartmentalisation; membranes and transport mechanisms; the cell surface; intracellular targeting of proteins including cotranslational and post translational pathways; transport and docking of vesicles; motor proteins, movement and the cytoskeleton; communication between cells including receptors and signal transduction pathways; cell cycle and its regulation; apoptosis; the molecular basis of cancer. Students will gain practical skills in plant and mammalian cell culture in the laboratory setting.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Describe in detail eukaryotic cell structures and their respective functions;
- Define the pathways of signal transduction and the cell cycle in normal and cancerous cells;
- Identify mechanisms of intracellular transport;
- Discuss the molecular basis of cancer;
- Appraise and synthesise relevant scientific literature.
- Demonstrate competency in plant and mammalian cell culture techniques.

Class Contact: Sixty-six (66) hours for one semester comprising lectures, laboratories and tutorials..
Required Reading: Becker, W., Kleinsmith, L.J., & Hardin, J. (2008). The world of the cell (7th ed.). Benjamin Cummings.
Assessment: In order to obtain a pass or higher in this graded unit, all components of assessment must be passed. Assignment, Assignment (one 1500 word assignment), 20%. Examination, A 3 hour written examination, 50%. Practicum, Practical Reports, 30%.

RBF2390 MOLECULAR GENETICS

Locations: Werribee.
Prerequisites:RBF1310 - BIOLOGY 1RBF1320 - BIOLOGY 2
Description: Introduction to developments at the forefront of molecular biology of gene structure and function and molecular genetics. The subject will build on material covered in Biochemistry 1 and Cell Biology and strengthen the foundations for the unit 'Genetic Engineering' in the final year of the degree program. Main topics include: organisation of eukaryotic genomes including repetitive and nonrepetitive DNA sequences, multigene families, pseudogenes; organisation of prokaryotic genomes; genomic rearrangements including transposable genetic elements, retroviruses and other mechanisms, genetic rearrangements in the immune system, replication of DNA, telomeres and telomerases, methylation and imprinting of DNA, mutations and repair mechanisms, regulation of gene expression, specialised genetic systems including genes in early development, genes responsive to hormones and heat shock.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Summarise the organisation, maintenance and evolution of eukaryotic genomes including repetitive and non-repetitive DNA sequences; 2. Connect known mechanisms of genomic rearrangement to observed features of eukaryotic genomes; 3. Connect the replication of DNA at the telomeres to problems associated with the maintenance of linear chromosomes, cancer and cellular aging; 4. Summarise the mechanisms of regulation of gene expression in eukaryotic organisms; 5. Explain epigenetic mechanisms of gene regulation including the methylation and imprinting of DNA; 6. Analyse the scientific literature on a genetic mechanism in a eukaryotic organism(s) and critically evaluate that information.
Class Contact: Four hours per week, comprising three hours of lectures and one hour tutorial, for one semester.
Required Reading: Krebs JE (2009) Genes X Jones & Bartlett
Assessment: Assignment, 2 x Assignments (1800 words each), 40%. Examination, 3 Hours, 60%.

RBF2520 BIOCHEMISTRY 1

Locations: Werribee, St Albans.
Prerequisites:RBF1310 Biology 1 and RCS1601 Chemistry 1A or equivalent.
Description: This subject aims to provide a general introduction to biochemistry and includes: structure and functions of carbohydrates, lipids, proteins and nucleic acids. Biological membranes. Enzymes: kinetics and regulatory enzymes. Metabolism: bioenergetics, glycolysis, citric acid cycle, chemiosmosis, gluconeogenesis, amino acid metabolism, fatty acid metabolism, photosynthesis. DNA: structure, replication, expression, and basic gene cloning.
Credit Points:12
Class Contact: Six hours per week, comprising three hours of lectures, two hours of laboratory, and one hour of tutorial work for one semester.
Required Reading: To be advised by lecturer.
Assessment: Practical work, 30%; final examination, 55%; assignment/test, 15%.

RBF2530 BIOCHEMISTRY 2

Locations: Werribee.
Prerequisites:RBF2520 - BIOCHEMISTRY 1
Description: The aim of this subject is to expand on material covered in Biochemistry 1, and complement the Molecular Cell Biology and Microbiology subjects. Along with Biochemistry 1, this subject will provide a solid foundation in biochemical principles, reactions and applications. Topics covered include bioenergetics, the pentose phosphate pathway, amino acid and nucleotide metabolism, photosynthesis, aspects of plant metabolism and biochemistry of neurotransmitters. Other topics covered will include the structure and function of biological molecules, ligand binding and conformational changes, mechanisms of enzyme action, advanced enzyme kinetics, regulation of biochemical systems such as hormonal and transcriptional control. Applied aspects of biochemistry will also be considered.
Credit Points:12
Class Contact: Six hours per week, comprising three hours of lectures, two hours of laboratory work and one hour tutorial for one semester.
Required Reading: To be advised by lecturer.
Assessment: Assignments, 15%; practical work (including test), 25%; final examination 60%.

RBF2610 FUNDAMENTALS OF ECOLOGY

Locations: St Albans.
Prerequisites:RBF1310 - BIOLOGY 1RBF1320 - BIOLOGY 2Or equivalents to be determined by Unit coordinator.
Description: History and nature of ecology; Ecology & evolution - natural selection and speciation; Niche concept - ecophysiology, limiting factors; Population biology - individuals, species and populations, population growth, demographics, life tables, age distributions, population regulation, intra- and interspecific competition, predation, parasitism, mutualism; Behaviour; Community - species diversity, species

abundance models, succession, food chains, trophic relationships; Ecosystems - energy transfer, geochemical cycles, global patterns and processes; World biogeography & biomes; Palaeoecology.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify key ecological processes at population, community and ecosystem levels;
- Relate ecological concepts to real-life field situations and environmental management;
- Determine methods of studying and measuring species behaviour, interactions and dynamics;
- Critically examine and communicate complex ecological thought in both written and spoken form.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and practicals (mainly field excursions).
Required Reading: Attiwill, P., & Wilson, B. (2006). Ecology: An Australian perspective. Oxford University Press.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Assignment, Field Studies, 50%. Examination, Examination, 50%.

RBF2620 AUSTRALIAN PLANTS

Locations: St Albans.
Prerequisites:RBF1310 - BIOLOGY 1RBF1320 - BIOLOGY 2Or equivalents to be determined by Unit coordinator.
Description: An understanding of: the diversity and evolution of plants and fungi, with emphasis on Australian native plants and fungi; the characteristic morphology and life history of the major plant groups and fungi; the basic principles of the systematics of Australian plants including biological nomenclature, identification and classification; and how the biogeography of Australian plants can be explained by their life history and the history of the continent, particularly to instil an understanding of how and why Australia has evolved a diverse and highly endemic primarily sclerophyllous flora where the forests and woodlands are dominated by two tree genera, Eucalyptus and Acacia.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify key morphological features and life history characteristics of plants;
- Distinguish major families, genera and species of Australian plants;
- Develop tools for collecting and preserving plant specimens and
- Use high-level identification guides to determine a range of plant species.
- Communicate in written form complex information on various plant families and their evolutionary history.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and practicals.
Required Reading: Knox, B., Ladiges, P., Evans, B., & Saint, R. (2001). Biology (2nd ed.). McGraw-Hill.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Assignment, Practicals, 60%. Examination, Examination, 40%.

RBF2630 COMMUNITY AND ENVIRONMENT

Locations: St Albans.
Prerequisites: Nil.
Description: Exploration of the various socially-based conceptual frameworks for understanding the range of environmental viewpoints in the community, and the consequences of these frameworks for practical environmental protection and repair. Practical experience in working with a wide range of community representatives on environmental protection and repair projects. Practical skills development in how to communicate with community groups and individuals, including clear, simple explanations, active and reflective listening, negotiating, consulting and drawing up and presenting project proposals. Insights into the range of skills and experience required to gain employment in environmental management fields, and the range of employment available.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Discuss complex issues relating to community participation in environmental protection and repair projects;
- Work collaboratively to develop and argue a number of position statements relating to environmental outcomes;
- Contribute positively to environmental projects in the local community.

Class Contact: Forty-eight (48) hours or equivalent for one semester (usually in block mode) comprising lectures, tutorials, practical workshops and site visits.
Required Reading: Irwin, A. (2001). Sociology and the environment. Oxford: Polity Press.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed Assignment, Assignment, 40%. Workshop, Practical workshop and field reports, 50%. Other, Evidence of contribution, 10%.

RBF2640 AUSTRALIAN ANIMALS

Locations: St Albans.
Prerequisites:RBF1310 - BIOLOGY 1RBF1320 - BIOLOGY 2
Description: Diversity of animal life, with an emphasis on the Australian fauna; the science of systematics, including cladistic analysis; Bauplans; evolution and origin of biodiversity in marine and terrestrial environments; historical and ecological biogeography, including faunal regions and habitat types; 'uniqueness' of the Australian fauna.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Describe characteristic features of major animal phyla;
- Outline the principles of ecological biogeography in relation to the fauna of Australia;

- Describe the features adopted by animals for living in either a marine, freshwater or terrestrial environment.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and practical classes composed mainly of field excursions.
Required Reading: Dorrit, R., Walker, W.F., & Barnes, R.D. (1991). Zoology. Thomson Learning
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Other, Practical, 40%. Examination, 3-hour, 40%. Assignment, Written, 20%.

RBF3110 MARINE & FRESHWATER ECOLOGY

Locations: St Albans.
Prerequisites:RBF1310 - BIOLOGY 1RBF1320 - BIOLOGY 2RBF2610 - FUNDAMENTALS OF ECOLOGYor equivalents.
Description: This unit provides an overview to the ecology and management of freshwater, estuarine and marine ecosystems in southern Australia. The material covered includes: ecology of upland and lowland-floodplain rivers (including impact of flow regulation and environmental water allocations); ecology of lakes and reservoirs (including algal bloom control and impacts of recreation); wetland ecology and management (including international conventions on waterbirds); seagrass, mangrove and saltmarsh ecology and management; significance of rocky shore habitats in southern Australia; estuarine ecology (with particular emphasis on Port Phillip Bay and the Gippsland Lakes) and environmental degradation and repair of aquatic systems.
Credit Points:12

Learning Outcomes: On successful completeion of this unit, students are expected to be able to:

- Distinguish marine and freshwater environments found in southern Australia
- Display skills in biological techniques utilized in marine and freshwater ecology;
- Identify forms of environmental degradation that occur in marine and freshwater environments;
- Differentiate amongst different management strategies applied in marine and freshwater ecology and critique their effectiveness.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures, tutorial/directed learning, and two (2) whole-day field excursions.
Required Reading: Boulton, A.J., & Brock, M.G. (1999). Australian freshwater ecology. Canberra: CRCFE Press. Underwood, A. J., & Chapman, M. G. (1995). Coastal marine ecology of south-eastern Australia. Sydney: UNSW Press
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Other, Continuous (within-semester) assessment at weeks 6 and 12, 60%. Report, Two field reports, 40%.

RBF3210 ENVIRONMENTAL REHABILITATION

Locations: St Albans.
Prerequisites:RBF1310 - BIOLOGY 1RBF1320 - BIOLOGY 2RBF2610 - FUNDAMENTALS OF ECOLOGY
Description: Introduction to a range of tools that will assist in the rehabilitation of Victoria s terrestrial environments and communities. Topics include the ecological parameters and adaptations of organisms in diverse environments and the key ecological relationships amongst organisms. Case studies of rehabilitation projects based on approaches using ecological theory will be included. Practicals will include hands-on experience in the use of the Native Vegetation Management Framework, the Habitat Hectare approach, development of land management plans, and specific threatened species rehabilitation programs.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply ecological principles to environmental rehabilitation practices;
- Work collaboratively to develop a land management plan;
- Communicate in oral and written form to professionals and the general community approaches to rehabilitation and complex ecological principles;
- Choose the correct method of assesment and management of communities and specific species;
- Apply the principles of the Habitat Hectare approach and the Native Vegetation Management Framework to environmental assessments.

Class Contact: Forty-eight (48) hours or equivalent per semester, timetabled as a block, comprising lectures, tutorials, practical workshops and site visits.
Required Reading: Cox, G. W. (1997). Conservation biology: Concepts and applications (2nd ed.). Dubuque, IA: Wm. C. Brown Publishers.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Project, Group, 40%. Report, Field and practical, 60%.

RBF3610 BIOSTATISTICS

Locations: St. Albans.
Prerequisites:RMA1110 - MATHEMATICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 1RMA1120 - STATISTICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 2
Description: This unit introduces students to the practical use of statistics in the biological, ecological and health sciences. Particular emphasis is given to experimental design and 'real world' use of statistical procedures. Material covered includes: Revision of statistical concepts and the significance of statistics/biometrics in biological/environmental analysis. Distributions and the nature of data; the use of correlation and regression in developing hypotheses. Sampling regimes and units, confounding variables, hypothesis testing, parametric versus non-parametric procedures and assumptions, post-hoc testing. Design tools for experimental and field collection of data; type-I versus type-II errors, statistical power and the use of statistical power in experimental design. BACI models and design issues; pseudoreplication and true replication. Optimisation of sampling regime for a given sampling unit and variance. Inferential procedures, multiple factorial designs, univariate versus multivariate procedures in biological and environmental programs.
Credit Points:12

Learning Outcomes: On successful completion of the unit, students are expected to be able to:

- Describe the main types of sampling distribution;
- Generate appropriate descriptive statistics from data obtained through environmental investigation;

- Utilise techniques such as regression, correlation, univariate and multivariate analysis;
- Critically evaluate experimental and statistical models;
- Select appropriate statistical methods for the testing of hypotheses;
- Generate multifactiorial experimental designs;
- Apply parametric and non-parametric methods to biometric data as appropriate;
- Control for confounding variables in experimental investigations;
- Recognise types of sampling error;
- Interpret the output from statistical testing.

Class Contact: Four hours per week over one semester, comprising two hours of lectures and two hours of interactive practicals/tutorials per week.
Required Reading: Zar, J.H. (1996). Biostatistical analysis (3rd ed). USA: Prentice Hall
Assessment: Assignments (20%); Examinations (80%)

RBF3620 CONSERVATION AND SUSTAINABILITY

Locations: St. Albans (offered subject to minimum enrolments in 2004).
Prerequisites:RBF1310 - BIOLOGY 1RBF1320 - BIOLOGY 2RBF2610 - FUNDAMENTALS OF ECOLOGY
Description: The subject ties together, in both theoretical and practical ways, concepts and practices for maintaining biological diversity, and how these concepts and practices can be integrated with social and economic needs.the development of conservation theory and practice in Australia; extinction and its significance, including pathways to extinction; the meanings, levels and interpretation of concepts of biodiversity; ecological and adaptive management approaches to conservation and recovery, including design of reserves, setting priorities, off-reserve conservation and ex-situ (captive breeding, reintroduction and translocation). Practical field studies and site visits will investigate the contributions of zoo's, national and state parks, friends groups, councils and shires, other government agencies and private landholders to the conservation and recovery of plant and animal species, from insects to mammals, and from mushrooms to trees. The subject will also include practical appraisals of techniques used to determine integrity of ecosystems, landscapes and overall environment, the contributions made by biodiversity to ecosystem services and integrated methods for recovery and sustainable management of species and ecosystems.
Credit Points:12
Class Contact: Four hours per week for one semester, comprising two hours of lectures and two hours of practical.
Required Reading: New, T., 1999, Conservation Biology. An Introduction for Southern Australia, Oxford University Press, United Kingdom and Australia.
Assessment: Practicals and assignments: 40%; examination: 60%.

RBF3630 ENVIRONMENTAL IMPACTS AND MONITORING

Locations: St. Albans (offered subject to minimum enrolments in 2004).
Prerequisites:RBF1310 Biology 1, RBF1320 Biology 2
Description: This subject aims to introduce students to the 'real world' application of ecological studies, especially in the process of sustainable development. Topics covered will include: Overview of Australian natural resources subject to environmental degradation (e.g. land, soil, water, biota); The social and industrial factors responsible for degradation (e.g. erosion, water pollution, salinisation, habitat destruction, exotic species, extraction, biodiversity loss etc); The Environmental Impact Assessment process used to quantify impacts (e.g. role of consultants, the EEI process itself); Approaches to monitoring environmental degradation and recovery (e.g. sampling design, monitoring procedures, rapid assessment protocols, ANZECC guidelines); Mechanisms and approaches available to minimise impacts (reserve systems, limits of acceptable change technologies, financial tools, role of government departments). Particular emphasis is given to 'hands on' experience.
Credit Points:12
Class Contact:four hours per week, comprising 1 x two hr lecture, 1 x two hr interactive tutorial/directed learning session (including group presentations).
Required Reading: Environment Australia, 2001, State of the environment, EA, Canberra. Thomas I., 1998, Environmental impact assessment in Australia, Federation Press, Sydney.
Assessment: Within-semester (on-going) assessment at Weeks 6 and 13 (60 %) plus one case study report or project (40 %, including group presentation).

RBF3650 POLLUTION BIOLOGY

Locations: St. Albans (this subject will first run in 2006).
Prerequisites:RBF2610 Fundamentals of Ecology, RBF1310 Biology 1, RBF1320 Biology 2, Biometrics RBF3610, or subject co-ordinators discretion.
Description: This subject aims to introduce students to the impact of pollutants on natural ecosystems. Topics covered include: Principles and concepts which apply to the analysis and evaluation of pollutant impacts on the natural environment. Experimental methodology employed in the evaluation of organism and ecosystem responses to pollutant exposure with special emphasis on statistical procedures which can be employed in evaluating impacts. Types of and significance of different groups of pollutants. Tolerance and susceptibility of organisms and biological systems to pollutants; pollution monitoring, biological indicators of pollution induced environmental stress; sequestering of exogenous compounds; partitioning; sources and environmental transport; uptake and depuration; case studies.
Credit Points:12
Class Contact: Four hours per week for one semester, comprising two hours of lectures and two hours of practical.
Required Reading: To be advised
Assessment: Practicals and assignments: 40 %; examination: 60 %.

RBF4001 SCIENCE HONOURS

Locations: Werribee.
Prerequisites: Nil.
Description: The program will consist of a research project and a coursework component. The major focus of the course component is research methodology and subjects include experimental design, statistics in research, data analysis, computer applications and software, literature analysis and critical appraisal, ethics in research, scientific writing and data presentation. The research project will be undertaken in one of the research areas of the School and may, subject to approval, be undertaken at an external location.Required Reading To be advised by the lecturer.
Credit Points:48
Class Contact: An average of 20 hours per week for one semester.
Required Reading: To be advised by the lecturer.
Assessment: The nature of the coursework assessment will vary and may be based on written assignments, seminar presentations and a written examination. The research project assessment will consist of an oral presentation and submission of a thesis.

RBF4002 SCIENCE HONOURS

Locations: Werribee.
Prerequisites:RBF4001 - SCIENCE HONOURS
Description: This subject, the aim of which is to enable students to competently

research an area of study utilising knowledge and skills gained in previous studies, consists of a project carried out by students on an individual basis. The project is expected to be a scientific investigation of an approved topic, followed by the submission of a suitably formatted thesis in which the topic is introduced and formulated; the scientific investigation described in detail; results and conclusions from the study are elaborated; and an extended discussion presented. The research project will be undertaken in one of the research areas of the School and may, subject to approval, be undertaken at an external location.

Credit Points:48

Class Contact: An average of 30 hours per week for one semester.

Required Reading: To be advised by the lecturer.

Assessment: The nature of the coursework assessment will vary and may be based on written assignments, seminar presentations and a written examination. The research project assessment will consist of an oral presentation and submission of a thesis.

RBM2201 CONSERVATION GENETICS

Locations: St Albans.

Prerequisites:RBF1310 Biology 1, RBF1320 Biology 2, RBF2610 Fundamentals of Ecology

Description: Context and overview Genetic diversity: single loci Genetic diversity: quantitative variation Large population: natural selection, adaptation, mutation and migration Small populations: loss of diversity, genetic drift, effective population size, inbreeding and inbreeding depression Captive populations: Management, reintroductions, breeding and case studies Molecular tools Species biology: taxonomy, genetic distances, tree of life, phylogeography and phylochronology, consequences of hybridization, management of hybridization and kinship Populations: structure, gene flow and fragmentation, conservation units, management and viability analysis. Life states and extinction modelling. Laboratory/ practical sessions DNA extraction Electrophoresis Determining ploidy levels Phylogenetics Polymerase Chain Reaction (PCR) methods for genetic analysis Inbreeding/outbreeding models Use of computer software for simulations (population viability analysis), and various genetic indices to determine phylogenetic relationships) Field Trips

Credit Points:12

Learning Outcomes: Upon completion of the subject, students will have a thorough understanding of the role and importance of genetics to the management of species and populations and its application to the field of natural resource management as a whole, including the limitations of genetic data. As well as having a theoretical basis on which to base management decisions, students will have practical experience with the methods used in modern genetics and how these tools can be applied to the management of species and populations. Students will be able to critically analyse published data relating to taxonomy and phylogenetic relationships and their implications for conservation. Students will therefore be equipped to make decisions about the appropriateness of reintroduction of plants or animals, and the implications of reproductive interventions such as manual pollination or selective breeding.

Class Contact: Five hours per week comprising two hours lecture per week and the equivalent of three hours per week practical work including laboratory sessions, field trips and computer sessions.

Required Reading: Frankham R, Ballou JD, Briscoe DA (2002) Introduction to Conservation Genetics. Cambridge University Press, Cambridge. 617pp

Assessment: Two hour written examination (40%). CGA: A2, P2, I2 Written assignment of 2000 words (30%). CGA: I2/3, P3, W2/3Class Presentation of the assignment (10%). CGA:-O2/3, I2Practical reports and simulations (20%). CGA: C2, P2, W2, A2

RBM3101 GEOGRAPHIC INFORMATION SYSTEMS (GIS) FOR CONSERVATION & HEALTH

Locations: St Albans.

Prerequisites:RBF2610 - FUNDAMENTALS OF ECOLOGYRBF2620 - AUSTRALIAN PLANTSRBF2640 - AUSTRALIAN ANIMALSRBM2260 - DIET AND NUTRITIONRBM2530 - PATHOPHYSIOLOGY 1RBM2540 - PATHOPHYSIOLOGY 2Either/ Or

Description: Types of data. GIS software applications in common use. Methods for data collection and entry, specific plotting and mapping of integrated data. The interpretation of complex temporal and spatial data. Practical applications of GIS including the use of data from programs that monitor and manage endangered species in the Australian context. Computer simulations and the formulation of models to predict the outcome of the effects of habitat degradation, conservation management activities or health service provision.

Credit Points:12

Learning Outcomes: The development of high level skills in locating, processing and evaluating information relevant to natural resource management, conservation and public health. The development of high level problem solving and decision-making abilities based on the interpretation of complex information. An ability to communicate complex information in written form.

Class Contact: Four hours per week comprising two hours of lecture and two hours of workshops providing hands on experience with data collection and GIS.

Required Reading: Students will be provided with recent case studies and research from the scientific literature along with material based on current research by University personnel and Associates. Excerpts from relevant software manuals will be provided.

Assessment: Laboratory reports and computer exercises (30%). CGA: P3, I3, O2, C2.Written Assignment of 2500 words based on analysis and discussion of GIS data: 40%: I3, P3, W3, A3.Examination (1.5 hours): 30%: The examination will assess the main theoretical concepts underlying the applications of GIS discussed throughout the unit. CGA: I3, A2

RBT8001 RESEARCH THESIS 1 FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:48

RBT8002 RESEARCH THESIS - SEM 2 (FULL-TIME)

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the

following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:48

RBT8011 RESEARCH THESIS 1 PART TIME

Prerequisites: Nil.
Description: Eligibility for entry to a Master of Science or Doctor of Philosophy program. This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:24

RBT8012 RESEARCH THESIS - SEM 2 (PART-TIME)

Locations: Werribee.
Prerequisites: Nil.
Description: Eligibility for entry to a Master of Science or Doctor of Philosophy program. This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:24

RCA1010 INTRODUCTORY AVIATION

Locations: Footscray Park.
Prerequisites: Nil.
Description: Aerodynamics and theory of flight, flight control systems, basic instruments. Domestic and international flight procedures, social structure of the regulatory system, domestic and international. Domestic legal rules, international treaties, domestic safety systems and safety experience. International safety experience.
Credit Points:12
Class Contact: One four hour seminar per week for one semester.
Required Reading: As set by the lecturer in charge.
Assessment: One major assignment 30% and one final examination 70%.

RCA1020 BASIC AERONAUTICAL KNOWLEDGE

Locations: Footscray Park.
Prerequisites:RCA1010 (The Civil Aviation Safety Authority also expects that students will have flown five hours before attempting this subject).
Description: Basic Aeronautics, engineering and mechanics sufficient to pass the BAK test as required by the CASA.
Credit Points:12
Class Contact: The equivalent of one four hour seminar per week for one semester. A concentrated mode of delivery may be used. Students may be required to attend classes off campus. Students should be aware that they are expected to obtain five hours flying experience on their own account before attempting the examination this subject.
Required Reading: As required by the Lecturer in charge.
Assessment: One final (principally multiple choice) examination worth 100% as required by the Civil Aviation Safety Authority.

RCA2020 METEOROLOGY AND HUMAN FACTORS FOR THE CPL

Locations: Footscray Park.
Prerequisites:RCA1020 Basic Aeronautical Knowledge (the Civil Aviation Safety Authority requires students to complete the General Flying Proficiency Test before attempting this subject).
Description: Aircraft navigation theory, and legal theory as required for the Commercial Pilot's Licence theory subjects 'CHUF Human Factors (Aeroplane and Helicopter) for the CPL' and 'CMET Meteorology (Aeroplane and Helicopter) for the CPL' examined by the Civil Aviation Safety Authority.
Credit Points:12
Class Contact: The equivalent of one four hour seminar per week for one semester. Students may be required to undertake multiple seminars each week, for less than one semester.
Required Reading: As required by the Lecturer in charge.
Assessment: Two Multiple Choice Examination as required by the Civil Aviation Safety Authority.

RCA2030 NAVIGATION AND FLIGHT AND AIR LAW FOR THE CPL

Locations: Footscray Park.
Prerequisites:RCA1020 Basic Aeronautical Knowledge (the Civil Aviation Safety Authority requires students to complete the General Flying Proficiency Test before attempting this subject).
Description: Aircraft navigation theory, and legal theory as required for the Commercial Pilot's Licence theory subjects 'CNAV Navigation (Aeroplane and Helicopter) for the CPL' and 'CLWA Flight rules and Air Law (Aeroplane and Helicopter) for the CPL' examined by the Civil Aviation Safety Authority.
Credit Points:12
Class Contact: The equivalent of one four hour seminar per week for one semester. Students may be required to undertake multiple seminars each week, for less than one semester.
Required Reading: As advised by the Lecturer in Charge of the subject.
Assessment: Two Multiple Choice Examination as required by the Civil Aviation Safety Authority.

RCA2040 AERODYNAMICS FOR THE CPL

Locations: Footscray Park.
Prerequisites:RCA1020 Basic Aeronautical Knowledge (the Civil Aviation Safety Authority requires students to complete the General Flying Proficiency Test before attempting this subject).
Description: Aircraft navigation theory, and legal theory as required for the Commercial Pilot's Licence theory subjects 'CADA Aerodynamics (Aeroplane and Helicopter) for the CPL' examined by the Civil Aviation Safety Authority.
Credit Points:12
Class Contact: The equivalent of one four hour seminar per week for one semester. Students may be required to undertake multiple seminars each week, for less than one semester.
Required Reading: As advised by the Lecturer in Charge of the subject.

Assessment: Two Multiple Choice Examination as required by the Civil Aviation Safety Authority.

RCA2050 AIRCRAFT GENERAL KNOWLEDGE FOR THE CPL

Locations: Footscray Park.

Prerequisites: RCA1020 Basic Aeronautical Knowledge (the Civil Aviation Safety Authority requires students to complete the General Flying Proficiency Test before attempting this subject).

Description: Aircraft navigation theory, and legal theory as required for the Commercial Pilot's Licence theory subjects 'CSYA Aircraft General Knowledge for the CPL' examined by the Civil Aviation Safety Authority.

Credit Points: 12

Class Contact: The equivalent of one four hour seminar per week for one semester. Students may be required to undertake multiple seminars each week, for less than one semester.

Required Reading: As advised by the Lecturer in Charge of the subject.

Assessment: One Multiple Choice Examination as required by the Civil Aviation Safety Authority.

RCA2060 OPERATIONS PERFORMANCE AND FLIGHT PLANNING FOR THE CPL

Locations: Footscray Park.

Prerequisites: RCA1020 Basic Aeronautical Knowledge (the Civil Aviation Safety Authority requires students to complete the General Flying Proficiency Test before attempting this subject).

Description: Aircraft Operations theory, and flight planning as required for the Commercial Pilot's Licence theory subject 'CFPA CPL Operations Performance and Flight Planning' examined by the Civil Aviation Safety Authority.

Credit Points: 12

Class Contact: The equivalent of one four hour seminar per week for one semester. Students may be required to undertake multiple seminars each week, for less than one semester.

Required Reading: As advised by the Lecturer in Charge of the subject.

Assessment: One Multiple Choice Examination as required by the Civil Aviation Safety Authority..

RCA3010 INSTRUMENT RATING (IREX)

Locations: Footscray Park.

Prerequisites: Nil.

Description: Aircraft flight planning theory sufficient to complete the IREX examination set by the Civil Aviation Safety Authority.

Credit Points: 12

Class Contact: 2 x three hour workshops per week for one semester, or equivalent.

Required Reading: Thom, T. et al, 2000, The Instrument Rating Manual, Aviation Theory Centre, Melbourne. Subject study notes as provided by the subject lecturer.

Assessment: Examination as required by the Civil Aviation Safety Authority.

RCA3030 METEOROLOGY AND HUMAN FATORS FOR THE ATPL

Locations: Footscray Park.

Prerequisites: RCA2020 - METEOROLOGY AND HUMAN FACTORS FOR THE CPLRCA2030 - NAVIGATION AND FLIGHT AND AIR LAW FOR THE CPLRCA2040 - AERODYNAMICS FOR THE CPLRCA2050 - AIRCRAFT GENERAL KNOWLEDGE FOR THE CPLRCA2060 - OPERATIONS PERFORMANCE AND FLIGHT PLANNING FOR THE CPL

Description: Meteorology and Human Factors sufficient to meet the requirements of the CASA examinations in these topics.

Credit Points: 12

Class Contact: The equivalent of one three hour seminar each week for one semester.

Required Reading: To be advised by lecturer.

Assessment: One 90 minute multiple choice examination and one 60 minute multiple choice examination.

RCA3040 FLIGHT PLANNING FOR THE ATPL

Locations: Footscray Park.

Prerequisites: RCA2020 - METEOROLOGY AND HUMAN FACTORS FOR THE CPLRCA2030 - NAVIGATION AND FLIGHT AND AIR LAW FOR THE CPLRCA2040 - AERODYNAMICS FOR THE CPLRCA2050 - AIRCRAFT GENERAL KNOWLEDGE FOR THE CPLRCA2060 - OPERATIONS PERFORMANCE AND FLIGHT PLANNING FOR THE CPL

Description: Aircraft flight planning theory sufficient to pass the Air Transport Pilot's Licence theory subject 'ATPL Flight Planning' examined by the Civil Aviation Safety Authority.

Credit Points: 12

Class Contact: 1 x three hour workshops per week for one semester, or equivalent.

Required Reading: Thom, T. et al, 2000, Aeroplane Operations Performance and Planning for the Air Transport Pilot, Aviation Theory Centre, Melbourne. Subject study notes as provided by the subject lecturer.

Assessment: Examination as required by the Civil Aviation Safety Authority.

RCA3050 NAVIGATION AND AIR LAW FOR THE ATPL

Locations: Footscray Park.

Prerequisites: RCA2020 - METEOROLOGY AND HUMAN FACTORS FOR THE CPLRCA2030 - NAVIGATION AND FLIGHT AND AIR LAW FOR THE CPLRCA2040 - AERODYNAMICS FOR THE CPLRCA2050 - AIRCRAFT GENERAL KNOWLEDGE FOR THE CPLRCA2060 - OPERATIONS PERFORMANCE AND FLIGHT PLANNING FOR THE CPL

Description: Navigation and flight and air law sufficient to meet the requirements of the CASA examinations in these topics.

Credit Points: 12

Class Contact: The equivalent of one three hour seminar each week for one semester.

Required Reading: To be advised by lecturer.

Assessment: Two 90 minute multiple choice examinations.

RCA3060 AERODYNAMICS AND AIRCRAFT SYSTEMS FOR THE ATPL

Locations: Footscray Park.

Prerequisites: RCA2020 - METEOROLOGY AND HUMAN FACTORS FOR THE CPLRCA2030 - NAVIGATION AND FLIGHT AND AIR LAW FOR THE CPLRCA2040 - AERODYNAMICS FOR THE CPLRCA2050 - AIRCRAFT GENERAL KNOWLEDGE FOR THE CPLRCA2060 - OPERATIONS PERFORMANCE AND FLIGHT PLANNING FOR THE CPL

Description: Aircraft aerodynamics and systems theory sufficient to pass the Air Transport Pilot's Licence theory subject 'ATPL Aerodynamics and Systems' examined by the Civil Aviation Safety Authority

Credit Points: 12

Class Contact: 1 x three hour workshop per week for one semester or equivalent.

Required Reading: Thom, T. et al, 2000, Aeroplane Operations Performance and Planning for the Air Transport Pilot, Aviation Theory Centre, Melbourne. Subject study notes as provided by the subject lecturer.

Assessment: Examination as required by the Civil Aviation Safety Authority.

RCA3070 PERFORMANCE AND LOADING FOR THE ATPL

Locations: Footscray Park.

Prerequisites: RCA2020 - METEOROLOGY AND HUMAN FACTORS FOR THE CPLRCA2030 - NAVIGATION AND FLIGHT AND AIR LAW FOR THE CPLRCA2040 - AERODYNAMICS FOR THE CPLRCA2050 - AIRCRAFT GENERAL KNOWLEDGE FOR THE

CPLRCA2060 - OPERATIONS PERFORMANCE AND FLIGHT PLANNING FOR THE CPL

Description: Aircraft performance theory, and loading theory sufficient to pass the Air Transport Pilot's Licence theory subject 'ATPL Performance and Loading' examined by the Civil Aviation Safety Authority.

Credit Points: 12

Class Contact: 1 x three hour workshop per week for one semester or equivalent.

Required Reading: Thom, T., et al, 2000, Aeroplane Operations Performance and Planning for the Air Transport Pilot, Aviation Theory Centre, Melbourne. Subject study notes as provided by the subject lecturer.

Assessment: Examination as required by the Civil Aviation Safety Authority.

RCM1114 INTRODUCTION TO COMPUTING AND THE INTERNET

Locations: Footscray Park.

Prerequisites: Nil.

Description: Algorithms for computational tasks. Overview of the Internet. Internet Connections. Web Design and Authoring. Characteristics and functions of browsers. Resources on the Internet, Surfing the Internet. Future of the Internet, Scripting Languages. The law and computer crimes. Reliability and safety of software systems. Australian Computer Society code of ethics.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Demonstrate sound Internet computing skills;
- Design and develop Web sites;
- Locate relevant Web-based resources;
- Identify and discuss social, ethical and Intellectual Property (IP) issues arising from computing in society.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and laboratory/tutorials.

Required Reading: Zeid, I. (2004). Mastering the Internet, XHTML, and JavaScript (2nd ed.). Pearson Education.

Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Assignment, Laboratory Work, 30%. Examination, Final, 70%.

RCM1115 COMPUTER SYSTEMS AND ARCHITECTURE

Locations: Footscray Park, Hong Kong.

Prerequisites: Nil.

Description: Computer systems components and their relationships. Operating system and its functions. Overview of Computer Science. Database management. Key milestones, concepts, and historical developments of computer systems. Representation of Information in Computer Systems: Equivalence of number systems, Operations on numbers. System architecture. Instruction execution processes and data structures, Machine instructions design, Assembly level programming. Novel and emerging architectures.

Credit Points: 12

Class Contact: Four hours per week for one semester, comprising two one-hour lectures and two one-hour laboratory/tutorial.

Required Reading: Nil.

Assessment: Final examination, 70%; assignment and tests, 30%.

RCM1613 APPLIED STATISTICS 1

Locations: Footscray Park.

Prerequisites: Nil.

Description: Data analysis and statistical techniques used in the workplace and community. Displaying and describing data. Sampling and population distributions. Control charts. Time series. Experimental design. Survey designs.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Explain data collection methods, types of variables, types of data
- Present data using graphical and numerical methods;
- Conduct elementary-level exploratory data analysis, to gain in particular, basic knowledge from real life data using basic statistical tools;
- Discuss the practice of quality control processes and charts in industries;
- Describe the principles of time series data modelling and forecasting;
- Describe the principles of experimental design and survey design;
- Explain correlation and regression analysis
- Obtain and interpret simple model fitting results using a software package.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and tutorials.

Required Reading: Victoria University, School of Computer Science and Mathematics. (2008). Lecture notes for Applied Statistics 1. Melbourne: Author.

Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Test, Tests, 40%. Examination, Final, 60%.

RCM1614 APPLIED STATISTICS 2

Locations: Footscray Park.

Prerequisites: Nil.

Description: Data analysis and statistical techniques used in the workplace and community. Probability distribution of discrete and continuous random variables. Inference on sample mean. Confidence intervals. t-tests. Comparing two means. Inference for population spread. Comparing two proportions. Distribution fitting and contingency tables. Regression and correlation. Using a Statistical Package.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Estimate and calculate probabilities of outcomes from a range of random variables using distributional properties;
- Make valid inferences from samples and explain the assumptions they have made to arrive at these inferences;
- Apply basic statistical techniques to formulate solutions to problems;
- Present solutions in a comprehensible statistical fashion.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and tutorials.

Required Reading: Triola, M. F. (2005). Elementary statistics (9th ed.). Pearson Education.

Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Test, Test, 40%. Examination, Final, 60%.

RCM1711 MATHEMATICAL FOUNDATIONS 1

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit consists of about five weeks of revision of fundamentals, including basic algebra, handling of functions, and some trigonometry. The rest of the unit is devoted to the algebra of matrices and vectors, and their application to geometry and linear systems.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Perform algebraic operations including the handling of indices and logarithms, factorization and expansion of simple expressions, and the simplification of fractions.
- Solve linear and quadratic equations presented in a variety of forms, and with different solution methods.
- Graph straight lines in the plane, and determine gradients and intersections.
- Use trigonometric functions to analyse geometric figures.
- Perform arithmetic on vectors and matrices;
- Apply matrices to the geometric transformation of vectors;
- Solve simultaneous linear equations using matrix methods.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures and tutorials.

Required Reading: Alasdair McAndrew (2011) Mathematical Foundations: notes for RCM1711 VU Publications

Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be submitted and an aggregate mark of at least 50% must be attained. Test, 8 small tests during class time., 20%. Test, Mid-semester test (1 hour), 30%. Examination, Final two-hour examination, 50%. The learning outcomes are tested in order with each of the class tests. The mid-semester test tests learning outcomes 1, 2, 3 and 4; the final exam tests all learning outcomes, with an emphasis on numbers 5, 6 and 7. The graduate capabilites are tested in each of the assessment tasks; however (4) is particularly tested in the weekly tests, during which the students are encouraged to collaborate.

RCM1712 MATHEMATICAL FOUNDATIONS 2

Locations: Footscray Park.

Prerequisites: Nil.

Description: Introduction to computer algebra software. Complex numbers: definition and basic operations, rectangular, polar and exponential forms. Combinatorics and the binomial theorem. Introduction to calculus: derivatives, rules for differentiation, applications to curve sketching, maxima and minima and solution of equations. Concepts of integration: area between curves. Integration methods: integration by substitution, integration by parts and partial fractions. Numerical integration: trapezoidal and Simpson's rule. First order differential equations: separation of variables method and application to growth/decay problems and Newton's law of cooling.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Perform arithmetic on complex numbers and plot them on an Argand diagram;
- Use the binomial theorem for expansion of algebraic forms;
- Explain the concepts of differentiation and integration, and the relationship between them;
- Differentiate standard algebraic and transcendental functions, using the product, quotient and chain rules;
- Perform indefinite and definite integration, using substitution, integration by parts and partial fractions;
- Apply simple numerical methods to equation solving and quadrature problems; and
- Solve simple differential equations taken from a variety of applications.

Class Contact: Forty-eight (48) hours or equivalent for one semester comprising lectures, tutorials and computer laboratories.

Required Reading: McAndrew, A. (2008). Combinatorics & alculus: Notes for RCM1712 Mathematical Foundations 2. Melbourne: Victoria University.

Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be submitted and an aggregate mark of at least 50% must be attained. Test, Mid-semester, 15%. Laboratory Work, Laboratory, 15%. Examination, Final, 70%.

RCM2112 OPERATING SYSTEMS

Locations: Footscray Park, Hong Kong, Malaysia, Singapore.

Prerequisites:RCM1115 - COMPUTER SYSTEMS AND ARCHITECTURE

Description: Processes. Deadlocks. Synchronization, Memory Management. File Systems. I/O Management Case Studies.

Credit Points:12

Class Contact: Four hours per week for one semester, comprising two one hour lectures and two hours laboratory/tutorial.

Required Reading:

Assessment: Final examination, 80%; assignment(s) 20%

RCM2313 SOFTWARE DEVELOPMENT

Locations: Footscray Park, Sydney, Hong Kong.

Prerequisites:RCM2312 Software Engineering 1, RCM1312 Programming 2

Description: The aim of this subject is to develop an appreciation of the process whereby software is developed in a production environment students will build upon and reinforce their knowledge of software engineering principles by working in a team on a real-life production project.

Credit Points:12

Class Contact: Four hours per week for one semester, comprising two one-hour lectures and two one-hour laboratory/tutorial.

Required Reading: Visual Basic Net Programming From Problem Analysis to Program Design, E. Doke, Susan Rebstock Williams C Nov 2004, Course technology, ISBN: 0619160101

Assessment: Final examination, 20% Labs, 30%Assignments, 25% Mid-Semester Test, 25% Final Test.In order to pass, students must obtain at least 25% of labs and assignments, and 25% of tests in this subject

RCM2316 NETWORK OPERATING SYSTEM ADMINISTRATION

Locations: Footscray Park.

Prerequisites:RCM2111 Data Communications and Networks 1.
Description: Protocols and Standards. TCP/IP protocol suite, connecting devices. Addressing. Routing. ARP. IP. ICMP. IGMP. UDP. TCP. SCTP. Multilcasting. DNS. TELNET. SMTP. SNMP.
Credit Points:12
Class Contact: Four hours per week for one semester comprising of two one hour lectures and one hour laboratory and one hour tutorial.
Required Reading:B. Forouzan, TCP/IP Protocol Suite, 3rd Ed., McGRaw Hill, 2006
Assessment: Final examination, 80%; laboratory work 20%.

RCM2511 IMAGE PROCESSING 1

Locations: Footscray Park, Sydney, Malaysia.
Prerequisites:RCM1114 - INTRODUCTION TO COMPUTING AND THE INTERNETAND either: RCM1711 Mathematical Foundations 1 OR RCM1712 Mathematical Foundations 2
Description: Image processing hardware: CCD cameras, scanners, frame-grabbing cards. Aspects of image processing: image restoration; image enhancement; computer vision; object recognition. Quantization and sampling; binary and grey-scale images. Basic point operations: thresholding; histogram equalization and stretching. Thinning and boundary following. Spatial filtering: linear and non-linear filters; applications to noise reduction, deblurring, and edge enhancement. Line recognition: the Hough transform. Filtering in the frequency domain: introduction to the Fourier transform and its uses. Low and high pass filtering; removal of periodic noise. Mathematical morphology: dilation and erosion; opening and closing. Applications to object recognition, boundary detection and skeletonization. Colour images: investigation of the colour spaces RGB and HSI; processing colour images. Image compression and storage; Huffman and run-length encoding.
Credit Points:12
Class Contact: Two hours of lectures, one hour of practical work, one hour tutorial per week.
Required Reading: None.
Assessment: Final examination 75%, laboratory assessment 25%;

RCM2611 LINEAR STATISTICAL MODELS

Locations: Footscray Park.
Prerequisites:RCM1614 Applied Statistics 2
Description: Simple and multiple linear regression models. General linear models with categorical data. ANOVA and simple experimental designs. Simple logistic regression models for binary response. Model building, diagnosis and validation.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: (1) build general linear regression models; (2) assess and diagnose general linear regression models by various numerical and graphical tools; (3) perform ANONA analysis and make simple experimental designs; (4) build and diagnose simple linear models for binary responses; and (5) present solutions in a comprehensible statistical fashion.
Class Contact:48 hours for semester and 4 hours per week, comprising one two-hour lecture, one one-hour tutorial and one one-hour laboratory.
Required Reading: No required text.
Assessment: The final mark is the weighted average of the three assessment components: 0.25Assignment+0.25Test+0.5Exam, which must be 50% or higher to pass the unit. Assignment, Data analysis report of 15 to 20 pages including graphs., 25%. Test, 1 hour test, 25%. Examination, 3 hour examination, 50%. The assignment is to model and analyze a data set by using a statistical software package, and report the results in a PDF or Word document. Both the test and examination are open book, and any calculators are allowed. Test assesses Learning outcomes #1, #2 and #3 Assignment and Examination assesses all the Learning Outcomes Graduate capabilities #1, #2 and #3 are assessed in the assignment, the test, and the examination. .

RCM2612 FORECASTING

Locations: Footscray Park, Off-shore, Sydney, Hong Kong, Malaysia.
Prerequisites:RCM1614 - APPLIED STATISTICS 2
Description: Introduction to forecasting- Overview, reason for use, procedure, basic steps. Basic forecasting tools - Plots, numerical summaries, Measuring forecast accuracy, prediction intervals. Smoothing methods - Moving averages, exponential smoothing, Holt's, Winters' and damped-tren models. Decomposition methods - Classical Decomposition and Census methods. Mixed models. Regression models. Time series analysis: autocorrelation patterns, Box-Jenkins methods for ARIMA models. Transfer FunctionsApplication to 'real' data. Uses of forecasting methods in practice. Real world issues.
Credit Points:12
Class Contact: Four hours per week for one semester, comprising two one-hour lectures and two one-hour laboratory.
Required Reading: Nil.
Assessment: Project, 40%; Examination, 60%.

RCM2712 MATHEMATICS OF CONTINUOUS PROCESSES A

Locations: Footscray Park.
Prerequisites:RCM1712 - MATHEMATICAL FOUNDATIONS 2
Description: First order and second order differential equations. Laplace and Fourier transforms and application to differential equations. Approximation via Taylor and Fourier series and elementary extension to orthogonal expansions. Multivariate calculus: partial derivatives and chain rule, multiple integration including regions and coordinate transformation. Improper integrals as well as functions defined by integrals. Modelling of continuous processes using differential and functional equations.
Credit Points:12
Learning Outcomes: Lecture and tutorial work as well as small group project work.
Class Contact:2 x 1hr lecture and 2 x 1hr tutorial for one semester.
Required Reading: Nil.
Assessment:15% mid-semester test (1 hour) 15% project work 70% end of semester examination (3 hours)

RCM2713 MODELLING FOR DECISION MAKING

Locations: Footscray Park, Hong Kong, Malaysia, Singapore.
Prerequisites:RCM1712 - MATHEMATICAL FOUNDATIONS 2
Description: Overview of the modelling process: problem identification, factors and assumptions, formulation and solution, interpretation comparison of results with original problem. Setting up models, interpretation of mathematical models. Interpolation, extrapolation, spectral decomposition and fitting models to data. Applications of continuous models via differential equations and data fitting. Discrete versus continuous modelling and discrete/continuous combinations with examples of general interest in a variety of fields.
Credit Points:12
Class Contact: Four hours per week for one semester.
Required Reading: Edwards, D. and Hamson, M., 1996, Mathematical Modelling Skills, Macmillan Press.
Assessment: Final examination, 80%; assignments, 20%.

RCM2914 PROJECT AND INVENTORY ANALYSIS

Locations: Footscray Park.

Prerequisites: Nil.

Description: Project Life cycle: phases and costing of life cycles; Project Evaluation: time value of money, break-even analysis, payback, Return on Investment; Inventory: cost components, models for Economic Order Quantity, Reorder Points, Safety Stock, Quantity Discounts.

Credit Points:12

Learning Outcomes: To be able to understand the life span of a business project from conception to disposal, what the elements of costs and benefits of a project are, and how alternative project proposals are evaluated. This subject also teaches various inventory issues, including the Economic Order Quantity models of Inventory Control.

Class Contact: Four hours per week for one semester, comprising two one-hour lectures and two one-hour laboratory/tutorial.

Required Reading: Jones, T., 2004, Business Economics and Managerial Decision Making, John Wiley

Assessment: Class Test 1 hour 20% P2, I2, W2, A2One Group Assignment, 2 or 3-persons 20% P2, I2, O2, W2, C2, D2Final Examination 3 hours 60%P2, I2, W2, A2

RCM2915 STOCHASTIC AND COMBINATORIAL OPTIMISATION

Locations: Footscray Park, Hong Kong, Malaysia, Singapore.

Prerequisites:RCM1613 - APPLIED STATISTICS 1OR equivalent unit to be determined by the Unit coordinator.

Description: Decision Analysis: Decision Making without and with Probabilities; Decision Tress, EVPI and EVSI. Multicriteria Decision Making: Scoring Model, Analytical Hierarchy Process; Spreadsheet Analysis. Selected Combinatorial Optimisation Models: Network Models - spanning tree, shortest path, and maximum flow problems; Set Covering Problem; Cutting Stock Problem; Bin Packing Problem. Queuing Theory: Basic components of a queuing model, arrival and service time distributions; operating characteristics of a queuing system; multiple server models; no waiting time and finite calling population; Economic Analysis; Spreadsheet Analysis.

Credit Points:12

Class Contact: Four hours per week for one semester; two hours lecture and two hour tutorial/laboratory.

Required Reading: Winston, W.L., 2004, Operations Research: Applications and Algorithms, 4th edn, Duxbury.

Assessment: Participation in Tutorials, 5%; Class Test, 15%; Assignment, 10% Final examination, 70%. To obtain a grade of pass or better a student must obtain 40% or more in the final examination.

RCM2917 LOGISTICS TECHNOLOGY AND SIMULATION

Locations: Footscray Park.

Prerequisites:RCM1114 - INTRODUCTION TO COMPUTING AND THE INTERNETOR equivalent

Description: Scope of Logistics; Logistics technologies e.g. Bar Code, RFID, EDI; Simulation modelling concepts: Application of simulation model (SIMAN, ARENA) for a logistic system.

Credit Points:12

Learning Outcomes: After completing the subject, a student is expected to be familiar with the technologies used to identify and locate the materials, and exchanging information relevant to logistics industry. They should be able to structure a logistics problem in a form that can be simulated; Develop models and their solutions using a simulation language.

Class Contact: Four hours per week for one semester, comprising two one-hour lectures and two one-hour laboratory/tutorial.

Required Reading:1) Kelton W.D., Sadowski R.P., & Sadowski D.A., 2002. Simulation with Arena 2/e McGraw Hill.

Assessment: Class Test 1 hour 15%P2, I2, W2, A2One Individual Assignment 25% P2, I2, W2, A3, D2Final Examination 3 hours 60% P2, I2, W2, A2

RCM2930 3D WEB TECHNOLOGIES

Locations: Footscray Park, Sydney, Hong Kong, Malaysia..

Prerequisites:RCM1312 - PROGRAMMING 2

Description:VRML/Java3D programming. Structure of a VR Object; Basic structures and adjustment of predefined simple and complex scenes. Adding processing capabilities to VR models by scripting languages. Adding audio-visual effects (light, sound, image texture mapping, audio and video), higher level tools for creating 3D virtual worlds and other approaches to 3D web content; scene graphs. Creating and navigating the virtual world. Creating interactive 3D graphic models and animations by Java 3D.

Credit Points:12

Class Contact: Four hours per week comprising of lectures and two hour of tutorial and computer laboratory.

Required Reading: Lectures notes provided by the lecturer.

Assessment: Normally Two Assignments, 30%; final examination, 70%.

RCM3001 PROJECT 1

Locations: Footscray Park, Sydney, Hong Kong, Malaysia.

Prerequisites:RCM1114 - INTRODUCTION TO COMPUTING AND THE INTERNETRCM1115 - COMPUTER SYSTEMS AND ARCHITECTURERCM1311 - PROGRAMMING 1RCM1312 - PROGRAMMING 2RCM1613 - APPLIED STATISTICS 1RCM1711 - MATHEMATICAL FOUNDATIONS 1RCM1713 - DISCRETE MATHEMATICSRCM2312 - SOFTWARE ENGINEERING 1

Description: This subject is based and involves projects with industry sponsors selected by the University. Students work in groups under the supervision of an Academic Staff member. For computing projects students are required to submit a specification document, a final project report and demonstrate the software. For non-computing projects students are required to submit a project specification and a final project report. In addition, all groups present progress and final oral presentations to other students, staff and industry partners.

Credit Points:12

Class Contact:four hours per week

Required Reading: Nil.

Assessment: Based on performance in the projects oral presentations and quality of final reports.

RCM3002 PROJECT 2

Locations: Footscray Park, Sydney, Hong Kong, Malaysia.

Prerequisites:ACE3145 - CSM PROFESSIONAL COMMUNICATIONRCM3001 - PROJECT 1

Description: Appropriate to the project involved, the student will be required to produce a number of documents such as test plan, design project report, user manual, e-poster and CD-ROM. The student will be continually supervised under the guidance of the subject co-ordinator and their project supervisors via weekly meetings at various stages of the project.The student's ability as a competent communicator in industry settings will be further developed through workshop activities. The writing of a group project report, writing professional applications, preparing for and role playing interviews and developing oral presentation skills will be included in the workshops.

Credit Points:12

Class Contact:1x two hr project meetings with subject co-ordinator and project supervisor; 1x two hr workshop.

Required Reading: Mohan T (et al) Communicating as Professionals, Thomson, Melbourne, 2004.

Assessment: Demo Presentations, 10%; User Acceptance Test, 20%; Attendance of Meetings and Online Logbook, 5%; Documentation, User Manual, 20%; Final Presentation & e-Poster, 20%Written Employment Application, 15%; Interviews, 10%.All items of assessment must be completed in order for a final result to be obtained in this subject

RCM3021 LOGISTICS ANALYSIS AND SOLUTIONS

Locations: City Flinders, Liaoning University, Shenyang, China.

Prerequisites: Nil.

Description: The unit of study aims to familiarise students with the process of resolving logistics related business problems through various analytic techniques and relating them to a number of problem areas. Topics include: problem identification; problem resolution; report preparation directed towards the analytical and optimisation aspects of logistics.

Credit Points:12

Learning Outcomes: On completion of the unit, students should be able to:

- Identify the logistic problems of transport that can be constructed as transportation, transshipment and shortest path models; evaluate and compare the alternative solutions, and recommend the best alternative,
- Identify the logistic problems of storage and material handling that can be constructed as container loading and bin packing models; evaluate and compare the alternative solutions, and recommend the best alternative,
- Interpret the various costs of keeping inventory, and compare the total costs of ordering and carrying different quantities using an economic order quantity model, and recommend the best alternative,
- Solve the models described above by applying MS EXCEL spreadsheets.

Class Contact: Equivalent to three hours per week. To be delivered as two hours of lectures and one hour of tutorials, workshops or modules or a delivery mode as approved by the Faculty of Engineering and Science.

Required Reading: None

Assessment: Case Study, Four Small Case Studies (500 words each x 4), 50%. Assignment, Minor Assignment (1000 words per person), 20%. Assignment, Major Assignment (1500 words per person), 30%. Case Studies: Learning Outcome 1, 2, 3, & 4; Graduate Capabilities 1,2,3,4 & 6 Minor Assignment: Learning Outcome 1, 2, 3 & 4; Graduate Capabilities 1,2,3,4,5,& 6 Major Assignment: Learning Outcome 1, 2, 3 & 4; Graduate Capabilities 1,2,3,4,5,& 6 .

RCM3111 DATA COMMUNICATIONS & NETWORKS 2

Locations: Footscray Park, Prerequiste(s) RCM2111 Data Communications & Networks 1.

Prerequisites: Nil.

Description: Review of data communication principles, standards and signals. Networked multimedia applications. Fundamentals of multimedia communications. Temporal relationships multimedia communications. Multimedia communications over wide area networks and local area networks. Internetworking and atm protocol.

Credit Points:12

Class Contact: Four hours contact per week for one semester comprising two one hour lectures and two one-hour laboratory/tutorial.

Required Reading: To be advised by lecturer.

Assessment: Final examination, 70%, assignments, 30%.

RCM3200 SELECTED TOPICS IN OPEN RES AND STATS

Prerequisites: Nil.

Credit Points:12

RCM3211 DATABASE SYSTEMS 3

Locations: Footscray Park, Sydney, Hong Kong, Malaysia.

Prerequisites:RCM2218 Database Systems 2.

Description: Data warehouse, datamart, knowledge discovery in databases, data mining algorithms, online analytic processing (OLAP), online transaction processing (OLTP), hypercubes, star schemas, Multidimensional analysis, ROLAP and MOLAP.

Credit Points:12

Class Contact: Four hours per week for one semester, comprising two one-hour lectures and two one-hour laboratory/tutorial.

Required Reading: Nil.

Assessment: Final examination, 70%; assignment and tests, 30%.

RCM3312 INTELLIGENT SYSTEMS

Locations: Footscray Park, Sydney, Hong Kong, Malaysia.

Prerequisites:RCM1312 Programming 2 and RCM1114 Introduction to Computing and the Internet

Description: Introduction to intelligent systems and artificial intelligence, including a study of knowledge representation and problem solving strategies of rule-based expert systems, fuzzy logic, artificial neural networks and genetic algorithms. Practical work includes JESS expert system shell.

Credit Points:12

Class Contact: Four hours per week for one semester, comprising two one-hour lectures and two one-hour laboratory/tutorial.

Required Reading: Negnevitsky, M., 2005, Artificial Intelligence, A Guide to Intelligent Systems, 2nd edn. Addison Wesley.

Assessment: Final examination, 80%; assignment(s), 20%.

RCM3314 OBJECT ORIENTED ANALYSIS AND DESIGN

Locations: Footscray Park, Sydney, Hong Kong, Malaysia.

Prerequisites:RCM2311 Object Oriented Programming 1.

Description: Review of object oriented design approaches; the Unified Modeling Language (UML); introduction to Rational Rose; the Unified Method; and Agile Modeling approach. design of domain layer; design of storage layer for the use of persistent objects; user interface design considerations; applying the patterns approache to analysis and design.

Credit Points:12

Class Contact: Four hours per week for one semester comprising of two one-hour lectures and two one-hour laboratory/tutorial.

Required Reading: Larman, C., 2005, Applying VML and Patterns Pearson Education.

Assessment: Final examination, 70%; Assignment and test, 30%.

RCM3711 COMPUTATIONAL METHODS

Locations: Footscray Park.

Prerequisites:RCM1712 - MATHEMATICAL FOUNDATIONS 2

Description: This unit introduces students to numerical and approximate techniques to solving applied mathematical problems. Topics include approximation and interpolation, optimization and root finding, linear algebra, quadrature, and methods for solving differential equations. The students will also be introduced to a modern computing environment.

Credit Points:12

Learning Outcomes: At the conclusion of this unit, students are expected to be able to

- Analyse the errors inherent in numerical processes.
- Fit an interpolation polynomial to a sequence of points using matrix methods, Lagrange polynomials, and Newton forward differences. Fit a piecewise cubic spline to data points.
- Apply techniques such as Newton-Raphson, secant and others to the solution of non-linear equations, and investigate the orders of convergence.
- Use iterative methods to solve linear systems, as well as partial pivoting to lessen errors in Gaussian elimination.
- Apply techniques such as Newton-Cotes rules and Gaussian quadrature to the approxiation of definite integrals, and analyse the errors.
- Investigate the numerical solution of differential equations using the methods of Euler, Heun, and Runge-Kutta.
- Implement all the above techniques using a computer algebra system, either handheld (CAS Calculator), or on a computer.

Class Contact: Forty-eight (48) hours for one semester comprising lectures and tutorials.

Required Reading: Alasdair McAndrew (2012) Computational Methods: Notes for RCM3711 VU Publications

Assessment: To pass the unit a student must obtain an aggregate mark of at least 50%. Test, One hour written test., 20%. Assignment, One practical assignment, 30%. Examination, Two hour end of semester exam, 50%. The test and exam will be mainly theoretical; the assignment mainly practical, and requiring extensive use of the computing environment. Learning Outcomes 1,2 3 will be assessed in the Test; Learning Outcomes 4,5,6 will be assessed in the Exam (which will also include some of 1,2,3); Learning Outcome 7 will be assessed in the Assignment. All Graduate Capabilities are assessed throughout. In particular, as this is a unit primarily for pre-service teachers, some emphasis will be placed on the place of this material in the secondary classroom.

RCM3950 INTERNET DATA MANAGEMENT

Locations: Footscray Park, Sydney (Alpha Beta College), Hong Kong, Malaysia..

Prerequisites:RCM2313 - SOFTWARE DEVELOPMENT

Description: Introduction to Class; Introduction to ASP.NET; Introduction to Visual Studio NET; Using Server Controls; Using ASP.NET Rich Controls; Using Visual Basic.NET Within an ASP.NET Page; Managing Data Sources; Building Data-Driven ASP.NET Applications; Building Data-Driven Web Applications; Configuring an ASP.NET Application; Troubleshooting and Deploying an ASP.NET Application.

Credit Points:12

Class Contact: Four hours per week for one semester, comprising one two-hour lecture and two one-hour laboratory/tutorial.

Required Reading: Introduction to ASP.NET, Kathleen Kalata, © 2002 Course Technology, 0-619-06321-1.

Assessment: Laboratory, 15%; Assignments,35%; mid-Semester Test (1 hour duration), 25%; final test (1 hour duration), In order to pass, students must obtain at least 25% of Labs and Assignment, and 25% of Tests in this subject

RCM5404 FINANCIAL DECISION SUPPORT SYSTEMS

Locations: Footscray Park.

Prerequisites: Nil.

Description: This subject focuses on modelling the financial flows associated with investment both in commercial projects and in financial assets. Topics may include: the riskless investment: compound interest, present-value and future-value of a sequence of dated cash-flows, measures of rate-of-return; the single-period risky investment, the Markowitz mean-variance comparison of investments; reduction of risk through portfolio optimisation; the capital asset pricing model; extension to multi-period risky investments; financial instruments underlying sources of finance, bonds, shares, options, futures, currencies; Black/Scholes pricing of options; interest rate risk (duration and convexity); software-packages for financial modelling.

Credit Points:12

Class Contact: Three hours per week comprising two hours of lectures and one one-hour tutorial.

Required Reading: Van Horne, J. et al. 1991, Financial Management and Policy in Australia, Prentice-Hall.

Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

RCM5601 FORECASTING

Locations: Footscray Park, Sydney, Hong Kong, Malaysia.

Prerequisites:RCM1614 - APPLIED STATISTICS 2

Description: Introduction to forecasting- Overview, reason for use, procedure, basic steps. Basic forecasting tools - Plots, numerical summaries, Measuring forecast accuracy, prediction intervals. Smoothing methods - Moving averages, exponential smoothing, Holt's, Winters' and damped-tren models. Decomposition methods - Classical Decomposition and Census methods. Mixed models. Regression models. Time series analysis: autocorrelation patterns, Box-Jenkins methods for ARIMA models. Transfer functions application to 'real' data. Uses of forecasting methods in practice. Real world issues.

Credit Points:12

Class Contact: Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory.

Required Reading: Nil.

Assessment: Project, 40%; Examination, 60%.

RCM5602 QUALITY MANAGEMENT AND STATISTICS

Locations: Footscray Park.

Prerequisites:RCM1614 - APPLIED STATISTICS 2

Description: Fundamental 'quality' and quality management' issues. Specifications and the loss function. Process capability and statistical process control. An introduction to feedback control. Factorial experiments and fractional designs. Taguchi methods.

Credit Points:12

Class Contact: Three hour mix of lectures, tutorials, practice and laboratory classes.

Required Reading: To be advised by lecturer.

Assessment: Final examination, 80%; Mid-semester tests, 20%.

RCM5800 OBJECT ORIENTED PROGRAMMING GD1

Locations: Footscray Park, VU Sydney.

Prerequisites: Nil.

Description: Programming language; basic object oriented concepts; programming, algorithm development and elementary data structures objects and classes.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Discuss and apply fundamental aspects of computer program development;
- Assess software development activities;
- Construct algorithms and create solutions using basic programming constructs;
- Manipulate primitive data types and structured data types;
- Design program using graphical user interface;
- Apply object-oriented approach to program design and implementation.

Class Contact: Thirty-six (36) hours for one semester comprising lectures and practicals.
Required Reading: Lewis J., DePasquale P., & Chase J (2011) 2nd Edition Java Foundations: Introduction to program design and data structures Pearson Education
Assessment: Assignment, Programming Assignment (500-700 lines of code), 15%. Laboratory Work, 5-6 Programming tasks, 15%. Examination, 3 hours written Final Examination, 70%. Assignment assesses: Learning Outcomes:1, 2, 3, 4, 5 and 6 and Graduate Capabilities:Problem solve in a range of settings; Locate,critically evaluate, manage and use written, numerical and electronic information; work both autonomously and collaboratively. Laboratory work assesses: Learning Outcomes:1, 2, 3, 4, 5 and 6 and Graduate Capabilities: Problem solve in a range of settings; Locate,critically evaluate, manage and use written, numerical and electronic information. Examination assesses: Learning Outcomes: 1, 2, 3, 4, 5 and 6 and Graduate Capabilities: Problem solve in a range of settings; Locate,critically evaluate, manage and use written, numerical and electronic information. .

RCM5802 INFORMATION SYSTEMS

Locations: Footscray Park, VU Sydney..
Prerequisites: Nil.
Description: Database concepts and design methodology; ER modelling; normalisation; relational approach and relational calculus; SQL; database applications.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Design databases by applying ER model and EER model;
- Design relational database queries with SQL;
- Design and develop database applications;
- Normalise a database to 3NF and BCNF

Class Contact: Thirty six (36) hours for one semester comprising lectures and practicals. 3 hours/week: two hours of lectures and one one-hour practical.
Required Reading: The listed text or advised by the lecturer. Elmasri, R., & Navathe, S. B. (2011) (6th ed.). Database Systems. Pearson. The lecturer may supply additional course material in addition to the required text.
Assessment: Examination, 3 hour examination, 70%. Test, 1 hour test, 10%. Assignment, Database application designing and implementation equivalent to 20 pages report, 10%. Laboratory Work, Eight to ten one-hour practical work, 10%. Examination assesses: Learning Outcomes (1, 2, 3, 4) and Graduate Capabilities (1,2,4,5,6) Test assesses: Learning Outcomes (1,2,3,4) and Graduate Capabilities (1,2,4,5,6) Assignment assesses: Learning Outcomes (1,2,3,4) and Graduate Capabilities (1,2,3,4,5,6) Laboratory work assesses: Learning Outcomes (1,2,3,4) and Graduate Capabilities (1,2,3,4,5,6) .

RCM5803 DATA STRUCTURES AND PROGRAMMING

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5800 Object Oriented Programming GD1
Description: Program development and testing using Software Engineering principles; object oriented programming languages; organisation and manipulation of data; the software environment; object oriented design and analysis; abstract data types.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply Software Engineering principles to computer program development;
- Select an appropriate data structure for a given problem type;
- Apply object-orientated principles to real-world problem solving;
- Formulate a suitable computing algorithmic solution for a problem description;
- Design computer programs using the advanced data structures;
- Manipulate classes provided in the programming API and incorporate them into computing solutions.

Class Contact: Thirty six (36) hours for one semester comprising comprising lectures and practicals. 3 hours/week: two hours of lectures and one one-hour practical.
Required Reading: Main & Savitch (2011) 4th ed. Data Structures and Other Objects Using C++ Pearson Education
Assessment: Examination, Final 3 hours written examination, 70%. Assignment, Programming Assignment(500-700 lines of code), 15%. Laboratory Work, 5 Programming Tasks, 15%. Examination assesses: Learning Outcomes 1., 2., 3., 4.and 5 and Graduate Capabilities Problem solve in a range of settings & Locate, critically evaluate, manage and use written, numerical and electronic information. Assignments assesses: Learning Outcomes 1., 2., 3., 4. and 5 and Graduate Capabilities; Problem solve in a range of settings ; Locate, critically evaluate, manage and use written, numerical and electronic information & Work both autonomously and collaboratively.

RCM5805 COMMUNICATION AND NETWORKS

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: Introduction - types of networks, master/slave polling networks, equality networks, circuit switches and packet switched networks, topologies, network structure, costings; layered design of networks and the ISO reference model - protocols, interfaces, communication techniques, multiplexing; public networks in Australia - Datel, DDS, Austpac, etc.; local area networks - transmission media, topologies, access control, comparison of local area network products; PC Networks - servers, workstations, network disks, directory structure, network security, access control and file locking.
Credit Points:12

Learning Outcomes: On successful completion of this unit , students are expected to be able to:

- Design enterprise networks with proper IP schemes, routing and switching protocols;
- Evaluate and resolve problems in existing networks;
- Design and implement interconnected networks with Cisco Routers and Switches;

Class Contact: Thirty-six (36) hours for one semester comprising lectures and laboratory work. 3 hours/week : two hours of lectures and one one-hour laboratory work.
Required Reading: Course material will be provided by the lecturer. Students who are interested in CISCO certificates may use certificate texts as the supplementary text.
Assessment: Will be based on a combination of examination and assignment. Examination, 2 hour examination, 60%. Assignment, Design and implementation of enterprise network with Cisco Routers and Switches, equivalent to 15 pages reports. , 40%. Examination assesses Learning Outcomes (1,2,3) and Graduate Capabilities (1,2,4,5,6) Assignment assesses Learning Outcomes (1,2,3) and Graduate Capabilities (1,2,3,4,5,6) .

RCM5807 ADVANCED INFORMATION SYSTEMS

Locations: Footscray Park, Hong Kong..
Prerequisites:RCM5802 - INFORMATION SYSTEMS
Description: Data analysis and modelling using the Enhanced Entity-Relationship model and normalisation. Constraints beyond the EER model, and advanced data modeling issues. Database transactions: concept, ACID properties, specification. Transaction processing: commit and rollback, concurrency control, locking, scheduling, and recovery. Database application development using embedded SQL.
Credit Points:12
Class Contact: Two hour lecture and one hour laboratory per week.
Required Reading: To be advised by lecturer.
Assessment: Final examination, 80%; test, 20%.

RCM5810 SOFTWARE DEVELOPMENT

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: Software development with Microsoft .NET Framework, including VB.NET, C#.NET, ASP.NET. Applications include database management systems, web systems and mobile applications.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Systematically apply design process and the implementation process for software development;
- Model and design software using different software development paradigms;
- Analyse the complexity of deliverable software products and;
- Develop a real-world or similulated real-world application with the software development techniques.

Class Contact: Thirty Six (36) hours for one semester comprising 1-hour lecture, 2-hour laboratories per week.
Required Reading: Stoecker, M.A. (2011). ISBN:0735627428. Windows Application Development with Microsoft .NET Framework 4. Microsoft Press,U.S. Northrup, T., & Snell, M (2011). ISBN: 0735627401. Web Applications Development with Microsoft .NET Framework 4. Microsoft Press,U.S.
Assessment: In order to pass, students must obtain at least 25% of the combined Laboratory and Assignment mark and 25% of Test and Examination mark in this unit. Each assignment is about 800 lines of code. Laboratory Work, Weekly one hour Labs, 20%. Assignment, Development of a Windows Application, 15%. Assignment, Development of a Web Application, 15%. Test, Mid-Semester Test (2 hours), 25%. Examination, Final Written Examination (2 hours), 25%. Laboratory Work assesses: Graduate Capabilities 1, 2,3, 4, 5 and Learning Outcomes 1, 2, 3, 4 Assignment 1 assesses: Graduate Capabilities 1, 2,3, 4, 5 and Learning Outcomes 1, 2, 3, 4 Assignment 2 assesses: Graduate Capabilities 1, 2,3, 4, 5 and Learning Outcomes 1, 2, 3, 4 Examination assesses: Graduate Capabilities 1, 2,3,4, 5 and Learning Outcomes 1, 2, 3, 4.

RCM5811 OPERATING SYSTEMS

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5801 - INTRODUCTION TO COMPUTER SCIENCEOR equivalent.
Description: Operating System (OS) concepts, OS architectures; threads and processes; concurrency issues and deadlocks, memory management, devices and device drivers; file systems, input and output case studies.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Summarise the role of an operating system;
- Appraise the tasks accomplished by an operating system as an interface between user and computer and as the resource manager for the computer system;
- Compare social impacts of different operating systems, including mobile OS;
- Apply concepts of resource allocation to case study problems;
- Research and report information on operating system types;
- Peer assess and evaluate critically written essays.

Class Contact: Thirty six (36) hours for one semester comprising lectures and laboratory/tutorial. 3 hours/week: two one-hours of lectures and one-hour practical.
Required Reading: McIver-McHoes & Flynn. (2008) 6th edn. Understanding Operating Systems Cengage Learning
Assessment: Examination, Final 3 hours written examination, 70%. Assignment, Written essay (2500-3000 words), 30%. Examination assesses: Learning Outcomes 1, 2, 3 and 4. and Graduate Capabilities; Problem solve in a range of settings, Locate, critically, evaluate, manage and use written, numerical and electronic information. Assignments assesses: Learning Outcomes 1, 2, 5, and 6. and Graduate Capabilities; Locate, critically, evaluate, manage and use written, numerical and electronic information, Communicate in a variety of contexts and modes; Work both autonomously and collaboratively.

RCM5813 ARTIFICIAL INTELLIGENCE

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5800 - OBJECT ORIENTED PROGRAMMING GD1
Description: Introduction to artificial intelligence and intelligent systems, including a study of knowledge representation and problem solving strategies of rule-based expert systems, fuzzy logic, artificial neural networks and genetic algorithms. Practical work provides exposure to various artificial intelligence strategies.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Compare various artificial intelligent technologies and their applications;
- Summarise the history and evaluate the social impacts of artificial intelligent systems;
- Research and report information on intelligent system types;
- Design and code computer programs which implement an artificial intelligence strategy;

Class Contact: Thirty six (36) hours for one semester comprising lectures and practicals. 3 hours/week: two hours of lectures and one-hour practical.
Required Reading: Negnevitsky (2011). (3rd ed.). Artificial Intelligence. Pearson Education.
Assessment: Examination, Final 3 hours written examination, 70%. Assignment, Report on problem solving task (2500-3000 words), 30%. Examination assesses: Learning Outcomes 1. and 2. and Graduate Capabilities: Locate, critically evaluate, manage and use written, numerical and electronic information. Assignments assesses: Learning Outcomes 3. and 4. and Graduate Capabilities Problem solve in a range of settings; Work autonomously and collaboratively; Work in an environmentally, socially and culturally responsible manner. .

RCM5814 COMPUTER GRAPHICS

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: This unit covers image process techniques including State Management and Drawing Geometric Objects, Viewing, Coloring, Lighting, Blending, Antialiasing, Fogging, Shading, Texture Mapping, and applying OpenGL for image processing.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply the principles of computer graphics;
- Model and represent 2D and 3D pictures;
- Apply the popular graphics algorithms and techniques for generating 2D and 3D animations;
- Develop 2D and 3D graphics programs, (e.g. using OpenGL).

Class Contact: Thirty Six (36) hours for one semester comprising 1-hour lectures, 2-hour laboratory per week.
Required Reading: Shreiner, D. (2009) 7/ISBN-10: 0321552628. OpenGL Programming Guide: The Official Guide to Learning OpenGL. Addison-Wesley Professional.
Assessment: In order to pass, students must obtain at least 25% of the combined Laboratory and Assignment and 25% of Examination mark in this unit. Laboratory Work, Weekly Labs, 20%. Assignment, 2-D Computer Graphics Assignment, 15%. Assignment, 3-D Computer Graphics Assignment, 15%. Examination, Final Examination (three hours), 50%. Laboratory Work - Capabilities 1, 2,3, 4, 5 and Learning Outcomes 1, 2, 3, 4 Assignment 1 - Capabilities 1, 2,3, 4, 5 and Learning Outcomes 1, 2, 3, 4 Assignment 2 - Capabilities 1, 2,3, 4, 5 and Learning Outcomes 1, 2, 3, 4 Examination - Capabilities 1, 2,3,4, 5 and Learning Outcomes 1, 2, 3, 4.

RCM5820 NETWORK OPERATING SYSTEMS ADMINISTRATION

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5805 Communication and Networks.
Description: Overview of computer networks. Architecture of a specific network operating system, e.g. Windows Enterprise or Data Center Servers, Network operating system components and their installation. Workstation and server configurations. Network applications. Network administration. Performance monitoring and tuning. Hands-on network installation and administration.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Design and deploy network operating systems for given enterprise context;
- Configure and manage network operating systems;
- Develop solutions for monitoring and optimising performance of network operating systems.

Class Contact: Thirty-six (36) hours for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.
Required Reading: Behrouz A. Forouzan (2007) 4/e Data Communications and Networking McGraw Hill
Assessment: Assignment, 2 assignments (25% each) for network operating system design, deployment, and management (each eqivalent to a report of about 15 pages). , 50%. Examination, Final examination (2 hours), 50%. Examination assesses: Learning Outcomes (1,2, 3) and Graduate Capabilities (1,2,4,5,6) Assignments assess assesses: Learning Outcomes (1,2, 3) and Graduate Capabilities (1,2,3,4,5,6) .

RCM5821 INTRODUCTION TO MULTIMEDIA SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: History and fundamentals of multimedia systems. Hypertext, CD-ROM based interactive multimedia. Components of a multimedia system: voice, graphics, animation, images, audio, and full-motion video. Standards for image compression. Multimedia operating systems. Multimedia databases. Multimedia authoring. Multimedia applications: educational systems, virtual environments, multimedia conferencing, knowledge-based multimedia systems.
Credit Points:12
Class Contact: Three hours per week for one semester, comprising one one-hour lectures and one two-hour laboratory/tutorial.
Required Reading: To be advised by the lecturer.
Assessment: Final examination, 80%; assignments, 20%.

RCM5822 NETWORK MULTIMEDIA SYSTEMS

Locations: Footscray Park.
Prerequisites:RCM5821 Introduction to Multimedia Systems.
Description: Components of networked multimedia systems. Multimedia object servers. Multimedia network topologies.Protocols and network services for multimedia. Distributed and collaborative multimedia systems. Application of ATM networks to distributed multimedia. Managing distributed objects. Networked Multimedia applications: video on demand systems, medical image database systems, networked virtual environments, multimedia conferencing.
Credit Points:12

Class Contact: Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory/tutorial.
Required Reading: Sharda, N., 1999, Multimedia Information Networking, Prentice-Hall.
Assessment: Final examination, 80%; assignments, 20%.

RCM5824 OBJECT ORIENTED PROGRAMMING GD2

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5800 Object Oriented Programming GD1
Description: This unit provides practice to object oriented programming and methodology using advanced features and the application programming interface of the Java programming language. A deeper discussion of classes and objects, encapsulation, polymorphism, inheritance, relationships among classes of objects and programming with related classes along with exception handling, multithreading, file I/O and building GUI components.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Revise the application of advanced computer programming constructs; 2. Compose object-orientated solutions for problem solving; 3. Evaluate and apply the concepts of inheritance and polymorphism amongst classes; 4. Develop computer programs using the advanced concepts of multithreading and exception handling; 5. Manipulate classes provided in the programming API and incorporate them into computing solutions; 6. Integrate advanced features of graphical user interfaces.
Class Contact: Thirty six (36) hours for one semester comprising lectures and laboratory work. 3 hours/week: two hours of lectures and one one-hour laboratory.
Required Reading: Deitel & Deital (2012). (9th ed.). Java How to Program. Pearson Education.
Assessment: Examination, Final 3 hours written examination, 60 %. Test, Written 1 hour test, 20%. Laboratory Work, Programming exercises (5-6), 10%. Assignment, Programming Assignment (700 -1000 lines of code), 10%. Examination assesses: Learning Outcomes: 1., 2., 3., 4., 5., and 6 and Graduate Capabilities: Problem solve in a range of settings; Locate, critically evaluate, manage and use written, numerical and electronic information. Test assesses: Learning Outcomes:1., 2., 3., 4., 5., and 6 and Graduate Capabilities: Locate, critically evaluate, manage and use written, numerical and electronic information. Laboratory work assesses: Learning Outcomes: 1., 2., 3., 4., 5., and 6 and Graduate Capabilities: Locate, critically evaluate, manage and use written, numerical and electronic information. Assignments assesses: Learning Outcomes: 1., 2., 3., 4., 5., and 6 and Graduate Capabilities: Locate, critically evaluate, manage and use written, numerical and electronic information, work both autonomously and collaboratively. .

RCM5825 WEB PROGRAMMING

Locations: Footscray Park, Hong Kong, Malaysia, Singapore.
Prerequisites:RCM5800 - OBJECT ORIENTED PROGRAMMING GD1
Description:HTML (and XHTML). JavaScript. Object-oriented programming in JavaScript. Communication between HTML/JavaScript and an applet. Adapting an applet for communication with HTML/JavaScript. Cascading style sheets (CSS). Using layered pages to achieve dynamic effects (DHTML). Communications: Java applications for internet communication; creating simple browsers and servers. Server-side programming: response to a client-submitted form; CGI; PHP; XML; XSL; RMI. Linking mobile telephones to the internet via WAP/WML technology.
Credit Points:12
Class Contact: Two hour lectures and 1 hour laboratory per week
Required Reading: Deitel, Deitel and Nieto, 2001 or later, Internet and World Wide Web: How to Program, Prentice Hall.

Assessment: Final Examination 58%, mid-semester practical test 30%, laboratory 12%

RCM5902 OPTIMISATION TECHNIQUES

Locations: Footscray Park.
Prerequisites: Consent of Lecturer
Description: Lecture Program Topics: Decision Tree and AHP; Maximal flow problems, Shortest-route problem, Minimal spanning tree problem, Estimating network flows; Queuing. Theory; Combinatorial Models: CSP, SCP, & BPP. Spreadsheet Analysis.
Credit Points:12
Class Contact: Three hours per week for one semester comprising lectures/tutorials.
Required Reading: To be advised by lecturer.
Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

RCM6021 LOGISTICS SOLUTIONS AND SYSTEMS

Locations: City Flinders, Liaoning-China, Sunway-Malaysia..
Prerequisites: Nil.
Description: The unit of study aims to familiarise students with the process of resolving logistics related business problems through the process of conducting logistics audits and relating them to a number of problem areas. Topics include: Problem Based Learning techniques; logistics audit methodologies; problem identification; problem resolution; report preparation directed towards the analytical aspects of logistics.
Credit Points:12
Learning Outcomes: Structure a specific problem and analyse the current industry environment in which the problem exists. Use audit report methods as a basis to provide management with options and viable solutions for a range of issues such as: Transport; Storage; Material Handling; Inventory; Procurement. Apply Problem Based Learning techniques as the learning medium.
Class Contact: Equivalent to three hours per week. Normally to be delivered as two hours of lectures and one hour of tutorials, workshops or modules or a delivery mode as approved by the Faculty of Business and Law. Unit of study equal to 12 credit points.
Required Reading: David Taylor, 1997, Global Cases in Logistics and Supply Chain Management, thomson Business Press.
Assessment: Case study/Problem solutions: 5 cases x 10 = 50%; One major project assignment, 4000 word report and oral presentation: 50%.

RCM6102 THESIS (2 UNITS)

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: The minor thesis enables students to apply knowledge and technical skills developed in the course. The thesis is a written report of an independently conducted academic research which demonstrates the student's ability to clearly define a problem, produce a research plan, to undertake the theoretical and experimental review of literature on the topic area. The suitably formatted thesis introduces and formulates the problem and describes the investigation. Results and conclusions from the study are elaborated, and a discussion presented. The student will be allocated supervisor(s) who will normally hold a degree at Master's level or above. RCM6102 thesis is to be completed by the end of semester.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify an academic research problem, design a produce a research plan;
- Choose a research methodology and methods and use these methods to collect and analyse data;
- Apply their academic learning to constructing a formal thesis incorporating a review of literature, a methodology and methods, collection and analysis of data, findings and conclusion.
- Prepare and deliver presentation on thesis topic;
- Format thesis according to VU guidelines.

Class Contact: No formal class contact, however, there will be regular meetings with the students' supervisor(s).
Required Reading: To be advised by the supervisor.
Assessment: The thesis will normally be assessed by an examiner from appropriate areas of expertise. Thesis, Final Report (up to 12,000 words), 85%. Presentation, Two Oral Presentation (20 minutes), 15%. Thesis examination assesses Learning Outcomes 1, 2, 3 and 5.and all Graduate Capabilities. Presentation assesses Learning Outcomes 1, 2 and 4 and Graduate Capabilities 1, 2, 3 and 5. .

RCM6103 THESIS (4 UNITS)

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: The minor thesis enables students to apply knowledge and technical skills developed in the course. The thesis is a written report of an independently conducted academic research which establishes the student's ability to clearly define a problem, produce a research plan, to undertake the theoretical and experimental review of literature on the topic area. The suitably formatted thesis introduces and formulates the problem and describes the investigation in detail. Results and conclusions from the study are elaborated, and an extended in depth discussion presented. The student will be allocated supervisor(s) who will normally hold a degree at Master's level or above. RCM6103 (48 CP) thesis is to be completed by the end of semester.
Credit Points:48

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify an academic research problem, design and produce a research plan;
- Choose a research methodology and methods and use these methods to collect and analyse data;
- Apply their academic learning to constructing a formal thesis incorporating a detailed review of literature, a methodology and methods, collection and in depth analysis of data, findings and conclusion.
- Prepare and deliver presentation on thesis topic;
- Format thesis according to VU guidelines.

Class Contact: No formal class contact, however, there will be regular meetings with the students' supervisor(s).
Required Reading: To be advised by supervisor.
Assessment: The thesis will normally be assessed by two examiners from appropriate areas of expertise. Thesis, Final Report (up to 20,000 words), 90%. Presentation, Two Oral Presentation (20 minutes), 10%. Thesis examination assesses Learning Outcomes 1, 2, 3 and 5.and all Graduate Capabilities. Presentation assesses Learning Outcomes 1, 2 and 4 and Graduate Capabilities 1, 2, 3 and 5. .

RCM6104 THESIS (1 UNIT)

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: The minor thesis enables students to apply knowledge and technical skills developed in the course. The thesis is a written report of an independently conducted academic research which demonstrates the student's ability to clearly define a problem, produce a research plan, to undertake the theoretical and experimental review of literature on the topic area. The suitably formatted thesis introduces and formulates the problem and describes the investigation in detail. Results and conclusions from the study are elaborated, and a discussion presented. To graduate, students are required to complete at least two thesis units (24 CP). RCM6105 (12 CP) is the second part of the 2-unit thesis, a continuation of RCM6104.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify an academic research problem and design a produce a research plan;
- Choose a research methodology and methods and use these methods to collect and analyse data;
- Apply their academic learning to constructing a formal thesis incorporating a review of literature, a methodology and methods, collection and analysis of data, findings and conclusion.
- Prepare and deliver presentation on thesis topic;
- Format thesis according to VU guidelines.

Class Contact: No formal class contact, however, there will be regular meetings with the students' supervisor(s).
Required Reading: To be advised by the supervisor.
Assessment:RCM6104 (12 CP) is the first part of a 2-unit thesis. On the completion of RCM6105 student will be awarded the same final mark in all thesis units. Thesis, Research plan and written literature review chapter, 85%. Presentation, Oral presentation (20 minutes), 15%. Thesis examination assesses Learning Outcomes 1, 2, 3 and 5.and all Graduate Capabilities. Presentation assesses Learning Outcomes 1, 2 and 4 and Graduate Capabilities 1, 2, 3 and 5. .

RCM6105 THESIS (1 UNIT)

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM6104 - THESIS (1 UNIT)
Description: The minor thesis enables students to apply knowledge and technical skills developed in the course. The thesis is a written report of an independently conducted academic research which demonstrates the student's ability to clearly define a problem, produce a research plan, to undertake the theoretical and experimental review of literature on the topic area. The suitably formatted thesis introduces and formulates the problem and describes the investigation in detail. Results and conclusions from the study are elaborated, and a discussion presented. To graduate, students are required to complete at least two thesis units (24 CP). RCM6105 (12 CP) is the second part of the 2-unit thesis, a continuation of RCM6104.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify an academic research problem and design a produce a research plan;
- Choose a research methodology and methods and use these methods to collect and analyse data;
- Apply their academic learning to constructing a formal thesis incorporating a review of literature, a methodology and methods, collection and analysis of data, findings and conclusion.
- Prepare and deliver presentation on thesis topic;
- Format thesis according to VU guidelines.

Class Contact: No formal class contact, however, there will be regular meetings with the students' supervisor(s).
Required Reading: To be advised by the supervisor.
Assessment: RCM6104 and RCM6105 form the 2-unit thesis (24 CP) normally to be assessed by an examiner from appropriate areas of expertise. On the completion of RCM6105 student will be awarded the same final mark in all thesis units. Thesis, Final Report (up to 12,000 words), 85%. Presentation, Two oral presentation (20 minutes each), 15%. Thesis examination assesses Learning Outcomes 1, 2, 3 and 5.and all Graduate Capabilities. . Presentation assesses Learning Outcomes 1, 2 and 4 and Graduate Capabilities 1, 2, 3 and 5.

RCM6106 THESIS (2 UNITS)

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: The minor thesis enables students to apply knowledge and technical skills developed in the course. The thesis is a written report of an independently conducted academic research which demonstrates the student's ability to clearly define a problem, produce a research plan, to undertake the theoretical and experimental review of literature on the topic area. The suitably formatted thesis introduces and formulates the problem and describes the investigation in detail. Results and conclusions from the study are elaborated, and a discussion presented. The student will be allocated supervisor(s) who will normally hold a degree at Master's level or above. RCM6106 is the first part of a 4-unit thesis. Normally, RCM6106 (24 CP) and its continuation RCM6107 (24 CP) are to be completed over two semesters.
Credit Points: 24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify an academic research problem and design a produce a research plan;
- Choose a research methodology and methods and use these methods to collect and analyse data;
- Apply their academic learning to constructing a formal thesis incorporating a review of literature, a methodology and methods, collection and analysis of data, findings and conclusion;
- Prepare and deliver presentation on thesis topic;
- Format thesis according to VU guidelines.

Class Contact: No formal class contact, however, there will be regular meetings with the students' supervisor(s).
Required Reading: To be advised by supervisor.
Assessment: RCM6106 (24 CP) the first part of a 4-unit thesis. On the completion of RCM6107 student will be awarded the same final mark in all thesis units. Thesis, Research plan and written literature review chapter, 85%. Presentation, Two oral presentations (20 minutes), 15%. Thesis examination assesses Learning Outcomes 1, 2, 3 and 5.and all Graduate Capabilities. Presentation assesses Learning Outcomes 1, 2 and 4 and Graduate Capabilities 1, 2, 3 and 5.

RCM6107 THESIS (2 UNITS)

Locations: Footscray Park, VU Sydney.
Prerequisites: RCM6106 - THESIS (2 UNITS)
Description: The minor thesis enables students to apply knowledge and technical skills developed in the course. The thesis is a written report of an independently conducted academic research which establishes the student's ability to clearly define a problem, produce a research plan, to undertake the theoretical and experimental review of literature on the topic area. The suitably formatted thesis introduces and formulates the problem and describes the investigation in detail. Results and conclusions from the study are elaborated, and an extended in depth discussion presented. RCM6107 (24 CP) is the second part of the 4-unit thesis, a continuation of RCM6106 (24 CP).
Credit Points: 24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify an academic research problem and design a produce a research plan;
- Choose a research methodology and methods and use these methods to collect and analyse data;
- Apply their academic learning to constructing a formal thesis incorporating a detailed review of literature, a methodology and methods, collection and in depth analysis of data, findings and conclusion.
- Prepare and deliver presentation on thesis topic;
- Format thesis according to VU guidelines.

Class Contact: No formal class contact, however, there will be regular meetings with the students' supervisor(s).
Required Reading: To be advised by the supervisor.
Assessment: RCM6106 and RCM6107 form the 4-unit thesis (48 CP) to be normally assessed by two examiners from appropriate areas of expertise. On the completion of RCM6107 student will be awarded the same final mark in all thesis units. Thesis, Final report (up to 20,000 words), 85%. Presentation, Two oral presentation (20 minutes each), 15%. Thesis examination assesses Learning Outcomes 1, 2, 3 and 5.and all Graduate Capabilities. Presentation assesses Learning Outcomes 1, 2 and 4 and Graduate Capabilities 1, 2, 3 and 5. .

RCM6501 IMAGE PROCESSING ALGORITHMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: An introductory subject which covers the fundamental algorithms used in image processing and pattern recognition. The topics include: point, algebraic and geometric operations; smoothing and edge detection, linear convolution, median and max/min filters, segmentation, Hough methods, morphological operations; image coding and compression. Introduction to pattern recognition algorithms. Artificial neural networks for pattern recognition, face recognition.
Credit Points: 12

Class Contact: Three hours per week for one semester comprising lectures/practicals/tutorials.
Required Reading: To be advised by lecturer.
Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes. Final examination, 70%; assignments and laboratory works, 30%.

RCM6601 RELIABILITY AND MAINTENANCE

Prerequisites: Nil.
Credit Points: 12

RCM6607 STATISTICAL COMPUTING

Locations: Footscray Park.
Prerequisites: Nil.
Description: Lecture Program Data manipulations using an appropriate language. What packages are available? Similarities and differences in what they can do. Writing macros or their equivalent. Producing graphical displays. (Including EDA). Statistical modelling. Creating useful output. Working with input from various sources. Using the Bootstrap. Using the Jackknife. Testing assumptions about data distributions. Practical program: laboratory sessions are designed to give students practical experience in using computers for statistical purposes.
Credit Points: 12
Class Contact: Three hours per week for one semester comprising lecture and practical.
Required Reading: To be advised by lecturer.
Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

RCM6608 MULTIVARIATE ANALYSIS

Locations: Footscray Park, Hong Kong, Malaysia, Singapore.
Prerequisites: Nil.
Description: This subject extends the concepts of estimation and statistical analysis to handle problems involving mandependent variables. Some of the more commonly used multivariate statistical procedures are presented in detail. The topics consist of: Covariance and Correlation: Population and sample covariance and correlation matrices; properties and tests. Linear combinations and multiple and partial correlation. Multivariate Normal Distribution: Features, properties and the key role it plays in many multivariate statistical procedures. Tests on mean vectors. Specific Procedures: Multivariate multiple regression, multivariate analysis of variance, canonical correlation, discriminant analysis, principal components, factor analysis and clustering techniques.
Credit Points: 12
Class Contact: Three hours per week for one semester comprising lecture and tutorial.
Required Reading: To be advised by lecturer.
Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

RCM6702 INTERNET DATA REPRESENTATION 1

Locations: Footscray Park, VU Sydney.
Prerequisites: RCM6822 - INTERNET PROGRAMMINGOR equivalent unit determined by Unit coordinator.
Description: XML data access and use; Metadata, such as Resource Description Framework; XML tools; XML definition and declaration, such as XML Schema; Parsers and validators; Presentation of XML data.
Credit Points: 12
Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply XML syntax to creating XML documents
- Apply different XML technologies to creating various types of documents
- Develop software tools for working on or with XML documents (such as XML parsers and validators)

Class Contact: Thirty-six (36) hours for one semester comprising lectures, tutorials and laboratory sessions.
Required Reading: Carey, P. (2007). (2nd ed.). New Perspectives on XML - Comprehensive. Course Technology.
Assessment: Assignment, Two assignments (10 hours), 30%. Examination, Final examination (3 hours), 70%. Assignments assess Learning Outcomes 1, 2 and 3 and Graduate Capabilities 1 and 2. Examination assesses Learning Outcomes 1 and 2 and Graduate Capability 1.

RCM6710 INTERNET DATA MANAGEMENT 1

Locations: Footscray Park, VU Sydney.
Prerequisites: RCM5810 - SOFTWARE DEVELOPMENT
Description: Introduction to Class; Introduction to ASP.NET; Introduction to Visual Studio.NET; Using Server Controls; Using ASP.NET Rich Controls; Using Visual Basic.NET Within an ASP.NET Page; Managing Data Sources; Building Data-Driven ASP.NET Applications; Building Data-Driven Web Applications; Configuring an ASP.NET Application; Troubleshooting and Deploying an ASP.NET Application.
Credit Points: 12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply object-oriented programming to plan and design web applications for real-world clients; 2. Integrate data sources with web applications; 3. Create and utilise web services; 4. Build a multi-tier web application.
Class Contact: Forty - Eight (48) hours for one semester comprising lectures,laboratory/tutorials.
Required Reading: Kalata,K (2004). Introduction To Asp.net. USA: Course Technology.
Assessment: To pass this unit students must obtain at least 25% of Assignments and 25% of Examination. Assignment, Assignment-1 (Web systems development), 25%. Assignment, Assignment-2 (Web systems development), 25%. Examination, Final 3 hours written examination, 50%. LiWC - 25% Assignment-2 Assignment 1 - Capabilities 1, 2,3, 4, 5 and Learning Outcomes 1, 2, 3, 4 Assignment 1 - Capabilities 1, 2,3, 4, 5 and Learning Outcomes 1, 2, 3, 4 Examination -Capabilities 1, 2,3,4, 5 and Learning Outcomes 1, 2, 3, 4.

RCM6812 CRYPTOGRAPHY COMPUTER & NETWORK SECURITY

Locations: Footscray Park, VU Sydney.
Prerequisites: A year of tertiary mathematics
Description: This unit introduces the theory and practice of modern cryptography - the mathematics of information security - as well as implementation using a modern high level computer system. Students will also briefly discuss cryptanalysis - the "breaking" of cryptogaphic systems - as well as the ways in which such systems can be used to increase security, or misused so as to compromise security. Topics include: Basic number theory: prime numbers, primarily testing, factorization, modular arithmetic, discrete logarithms. Simple (classical) cryptosystems; methods of attack. Public key cryptosystems: RSA, Rabin, El Gamal. Uses and weaknesses. The knapsack cryptosystem and its cryptanalysis. Block ciphers and modes of encryption. Hash functions, message authentication codes and their importance to

communications security The Data Encryption Standard: history, structure, weaknesses. Finite fields and the Advanced Encryption Standard: history and structure, and a simple version for hand computation.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Perform modular computations by hand, include modular exponentiation.
- Cryptanalyse classical ciphers, and evaluate the security of such systems by different models of cryptanalysis.
- Apply modular arithmetic to the implementation of modern public-key cryptosystems.
- Analyse strengths and weaknesses in different systems.
- Implement the basic structure of the DES and AES private-key systems.
- Summarise the uses of hash functions in a modern security environment, and critically analyse a hash function for its suitability.
- Justify the strengths and limitations of cryptography in a complete security system.
- Implement cryptographic algorithms in a modern high level computer system.
- Perform security configuration on Cisco routers.

Class Contact: Thirty Six (36) hours for one semester comprising 24 hours lectures and 12 hours computer laboratory work. 3 hours/week: 2 hours lectures and 1 hour computer laboratory
Required Reading: Textbook:Stallings, W. (2013). (6th ed.). Cryptography and Network Security. Pearson. Lecture Notes.
Assessment: Laboratory Work, 10 Security Labs, 30%. Examination, Paper Exam (3 hours), 70%. Each computer laboratory consists of a number of questions: of problems to be solved by using the system. These problems are scaffolded to range from simple changing the values in a given command, to programming and implementing a complete cryptographic system. Laboratory Work assesses Learning Outcomes 3,8 & 9 : The 10 security labs will enable students to apply their academic knowledge in a real world situations. Examination assesses Learning Outcomes 1,2,4,5,6 & 7 : The examination enables students to apply their academic knowledge to solve theoretic security problems. Graduate Capabilities for Labs and Examination (1, 2 of the GC): Problem solve in a range of settings; Locate, critically evaluate, manage and use written, numerical and electronic information. .

RCM6813 INTERNET SECURITY

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5800 - OBJECT ORIENTED PROGRAMMING GD1RCM5802 - INFORMATION SYSTEMS
Description: This unit covers computer security process, human factors, physical security mechanisms, software security, encryption and key management, firewalls, secure sockets (Secure Socket Layer-SSL), email security (PGP and GnuPG, S/MIME), hacking analysis and enforcing security with Cisco equipments.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply the theoretical algorithms which underlay modern network security;
- Implement these algorithms in JavaScript;
- Apply cryptosystems for security systems;
- Justify the strengths and limitations of cryptography;
- Justify and use appropriate security measures for a variety of security tasks;
- Configure IPSec and SSL on Cisco routers.

Class Contact: Thirty- six (36) hours for one semester comprising lectures and computer laboratory work. 3 hours/week: 2 lectures and 1 computer laboratory.
Required Reading:WILLIAM STALLINGS/2013 Sixth Edition Cryptography and Network Security PEARSON Supplied notes
Assessment: Laboratory Work, 10 X 1hour Practical Labs , 30%. Examination, Paper Examination (3 hours), 70%. Each computer laboratory consists of a number of questions: of problems to be solved by using the system. These problems are scaffolded to range from simple changing the values in a given command, to programming and implementing a complete cryptographic system. Laboratory Work assesses Learning Outcomes 2 & 6. The 10 security labs will enable students to apply their academic knowledge in a real world situations. Examination assesses Learning Outcomes 1,3,4 & 5. The examination enables students to apply their academic knowledge to solve theoretic security problems. Graduate Capabilities for Labs and Examination: Problem solve in a range of settings; Locate, critically evaluate, manage and use written, numerical and electronic information. .

RCM6814 ENTERPRISE - WIDE COMPUTING

Locations: Footscray Park.
Prerequisites:RCM5800 - OBJECT ORIENTED PROGRAMMING GD1RCM5802 - INFORMATION SYSTEMSRCM5805 - COMMUNICATION AND NETWORKSRCM6822 - INTERNET PROGRAMMING
Description: Introduction to electronic commerce.Internet and World Wide Web technology.Data warehouses and data mining technology.Information security technology.Electronic payment.
Credit Points:12

Learning Outcomes: On successful completion of this subject, student should be able to:

- develop electronic commerce applications with Internet and World Wide Web technology;
- understand how to build secure electronic commerce with information security technology and payment systems;
- make business trend prediction with data mining technology.

Class Contact:3 hours/week: lectures, tutorials, seminars and computer laboratory
Required Reading:H. Chan, R. Lee, T. Dillon, and E. Chang. E-Commerce: Fundamentals and Applications. John Wiley & Sons, 2001.
Assessment: Examination (70%): 3 hours duration, closed book written paper. Teamwork assignment: case study of electronic commerce development for group working. This technology based assignment with a level of difficulty appropriate for 30% of the total mark in the subject.

RCM6815 THEORETICAL COMPUTER SCIENCE 1

Locations: Footscray Park, Hong Kong, Malaysia, Singapore.
Prerequisites: Nil.

Description: Theoretical computer science is the foundation of computer science and this subject introduces some of the central topics in theoretical computer science. It covers computability theory, formal languages, logic and automated deduction, computational complexity (including NP-completeness), and programming language semantics.
Credit Points: 12
Class Contact: Three hours per week for one semester, comprising two hours of lectures and one hour of laboratory.
Required Reading: Ron Sigal, Elaine J. Weyuker, Theoretical Computer Science by Martin Davis, Elsevier, 1994.
Assessment: Assignment 40% and final examination 60%.

RCM6819 USER INTERFACE DESIGN

Locations: Footscray Park, VU Sydney.
Prerequisites: RCM6822 Internet Programming
Description: User interface design principles; guidelines for user interface design; practical issues in design and usability during software development; user interface evaluation; application in real world applications such as producing software artefact for mobile devices (e.g. Android Phone, Windows Phone, and iPhone)
Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Analyse and design user friendly user interface for software products;
- Evaluate user interface design and develop improvement to mal designed user interfaces and;
- Design real world applications applying user interface design principles.

Class Contact: Thirty six (36) hours for one semester comprising lectures and tutorials. 3 hours/week: two hours of lectures and one-hour tutorial.
Required Reading: Materials to be distributed by the lecturer, including articles reporting latest user interfaces design methods.
Assessment: Assignment, The analysis, design and implementation of a real world application with friendly user interface (up to 20 pages report). , 40%. Examination, 2 hours written examination, 60%. Assignment assesses Learning Outcomes (1, 2, 3) and the Graduate Capabilities (1,2,3,4,5,6) Examination assesses Learning Outcomes (1, 2, 3) and the Graduate Capabilities (1,2,4,5,6) .

RCM6820 DISTRIBUTED SYSTEMS

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: This unit will cover advanced topics in distributed systems, including networks in distributed systems, Client-Server models, group programming, concurrency control, multithreading and cloud computing.
Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Design parallel, distributed architectures including the network design and software architecture design;
- Design concurrency control mechanisms for distributed system; and
- Design and develop distributed system solutions for real applications, such as cloud services.

Class Contact: Thirty six (36) hours for one semester comprising lectures and tutorial/laboratory. 3 hours/week: two hour lecture and one-hour tutorial/laboratory.
Required Reading: Materials will be distributed by the lecturer.
Assessment: Assignment, Design and development of a distributed system (equivalent to a 15 page report). , 30%. Examination, Three hour written examination, 70%. Assignment assesses Learning Outcomes (1, 2, 3) and Graduate Capabilities (1,2,3,4,5,6) Examination assesses Learning Outcomes (1, 2, 3) and Graduate Capabilities (1,2,4,5,6) .

RCM6821 DECISION SUPPORT TECHNOLOGY

Locations: Hong Kong, Footscray.
Prerequisites: Nil.
Description: Processes and phases of organisational decision making and modelling. Online analytic processing (OLAP) vs online transaction processing (OLTP). Decision support framework and applications. Data requirements and benefits of decision support systems. Structure, components and types of decision support systems. Data mining concepts. Data warehouse vs production systems. Warehouse data characteristics and requirements. Data fusion and data scrubbing. Data models for data warehouse and data mart. Star schemas and hypercubes. Multidimensional analysis ROLAP MOLAP and HOLAP. Data warehouse administration. Warehouse database management technology.
Credit Points: 12
Class Contact: Three hours per week two hours lecture and one-hour laboratory/tutorial.
Assessment: Final examination 70%. Assignment/Test 30%.

RCM6822 INTERNET PROGRAMMING

Locations: Footscray Park, VU Sydney.
Prerequisites: RCM5800 - OBJECT ORIENTED PROGRAMMING GD1
Description: This unit develop the core concepts of web technology; HTML (and XHTML), JavaScript. Cascading style sheets (CSS), using layered pages to achieve dynamic effects (DHTML), programming Android devices.
Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply client web technologies;
- Design and implement website using HTML and CSS;
- Apply JavaScript to provide better website user experience;
- Design and develop Android Apps.

Class Contact: Thirty six (36) hours for one semester comprising lectures and laboratory work. 3 hours/week: two hour lectures and one-hour laboratory
Required Reading: Carey, P (2010). (3rd ed.). New Perspectives HTML, XHTML and XML. Course Technology, Cengage Learning. Felke-Morris, T (2011). (5th ed.). Web Development and Design Foundations with XHTML. Addison-Wesley.
Assessment: Test, End of semester practical test, 10%. Laboratory Work, Five programming exercises per semester, 10%. Assignment, Programming assignment, 20%. Examination, Final 2 hour written examination, 60%. Test assesses: Learning Outcomes 1, 2 and 3 and Graduate Capabilities 1, 2, 3, 4. Assignment assesses: Learning Outcomes 1, 2, 3, 4 and Graduate Capabilities 1, 2, 3, 4, 5. Laboratory assesses: Learning Outcomes 1, 2, 3, 4 and Graduate Capabilities 1, 2 and 3

Examination assesses: Learning Outcomes 1, 2, 3 , 4 and Graduate Capabilities. 1, 2, 3, 4, 5 .

RCM6823 DATABASE DESIGN, MANAGEMENT AND ADMINISTRATION

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5802 - INFORMATION SYSTEMSGood knowledge of relational databases; basic understanding of UNIX.
Description: Database Environment. Database planning, design and administration. Methodology - physical database design. Database integrity and security. Transaction management. Distributed database systems.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply the fundamental elements of a relational database management system;
- Model and Design database application scenarios with ER and EER diagrams;
- Convert ER diagrams into relational tables, populate a relational database and formulate SQL queries on the data;
- Criticize a database design and improve the design by normalization;
- Determine a physical database design by considering various file organisations and file indexing techniques;
- Create database views to enhance database security and performance;
- Design concurrency control and recovery for multi-user database systems.

Class Contact: Thirty six (36) hours for one semester comprising lectures and labs 3 hours/week: Two hour lectures and one hour laboratory.
Required Reading: Connolly, T., & Begg, C. (2010). (5th ed.). Database Systems: A Practical Approach to Design, Implementation and Management. Addison-Wesley.
Assessment: Examination, 3 hour examination, 70%. Test, 1 hour test, 10%. Assignment, Database application design and implementation, management, and admin equivalent to 10 page report, 10%. Laboratory Work, Weekly exercises (1 hour per week), 10%. Examination assesses Learning Outcomes (1,2,3,4,5,6,7) and Graduate Capabilities (1,2,3,4,5,6) Test assesses Learning Outcomes (1,2,3,4,5,6,7) and Graduate Capabilities (1, 2, 3, 4, 5) Assignment assesses Learning Outcomes (1,2,3,4,5,6,7) and Graduate Capabilities (1, 2, 3, 4, 5, 6) Laboratory work assesses Learning Outcomes (1,2,3,4,5,6,7) and Graduate Capabilities (1, 2, 3, 4, 5, 6) .

RCM6825 MULTIMEDIA SYSTEMS DESIGN AND DEVELOPMENT

Locations: Footscray Park.
Prerequisites:RCM5800 - OBJECT ORIENTED PROGRAMMING GD1
Description: The aim of this subject is to develop a clear understanding of the processes and current methodologies used in the design and development of multimedia systems. The subject introduces some new 3D web graphics technologies related to multimedia system development, including java 3D and Virtual Reality Modeling Language (VRML)
Credit Points:12
Class Contact: Three hours per week for one semester, comprising two one-hour lectures and one one-hour laboratory.
Required Reading:to be advised by the lecturer
Assessment: Final Examination, 50%; Project, 50%.

RCM6827 RESEARCH PERSPECTIVES IN COMPUTER SCIENCE

Locations: Footscray Park, VU Sydney.
Prerequisites: Nil.
Description: Writing a research proposal, conducting a literature review, writing a thesis, giving presentations, human research ethics, intellectual property.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Conduct a survey of literature;
- Apply principles of Human Research Ethics;
- Present research orally;
- Apply concepts associated with writing a research thesis;
- Apply principles of intellectual property;
- Write a research proposal.

Class Contact: Forty-eight (48) hours for one semester comprising lectures, tutorials and laboratory sessions.
Required Reading: To be advised
Assessment: The assessment consists of 4 assignments, each is equivalent to about 10-15 pages of report (depends on the topics selected). Assignment, Assignment 1 (Literature Review), 25%. Assignment, Assignment 2 (Research Proposal), 25%. Assignment, Assignment 3 (Research Ethics and Intellectual Property), 25%. Assignment, Assignment 4 (Data Analysis), 25%. The assignment 1 assesses: Learning Outcomes 1 & 3 and Graduate Capabilities 2 & 6; The assignment 2 assesses: Learning Outcomes 4 & 6 and Graduate Capabilities 2 & 3; The assignment 3 assesses: Learning Outcomes 2 & 5 and Graduate Capabilities 1 & 3; The assignment 4 assesses: Learning Outcomes 4 & 6 and Graduate Capabilities 1 & 2. .

RCM6830 KNOWLEDGE ENGINEERING AND E-COMMERCE TECHNOLOGY

Locations: Footscray Park, Hong Kong.
Prerequisites: Competency in a programming language.
Description: This subject introduces students to concepts of knowledge and systems engineering with particular emphasis on electronic commerce systems. A study is made of the current and past technologies that have enabled the recent growth and establishment of electronic commerce. The supporting technologies needed for the three-tiered architecture of electronic commerce sites, i.e. front end interfaces, middleware and backend servers together with their databases, are investigated in detail and form the basis of practical exercises.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two one-hour lectures and one one-hour laboratory/tutorial.
Required Reading: To be advised by lecturer.
Assessment: Final examination, 80%; assignment/tests, 20%.

RCM6841 SOFTWARE ENGINEERING 2

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM6844 Software Engineering 1.
Description: This unit covers the software engineering knowledge areas of software estimation, software planning and software process improvement. Topics include CoCOMO model, task flow graph, capability maturity models, requirement management, project planning, project tracking and oversight, configuration

management and quality assurance.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Design and develop solutions applying core body of knowledge in software estimation, planning and software process improvement;
- Develop software estimation and plan for software projects;
- Design and develop software process improvement models and strategies.

Class Contact: Thirty Six (36) hours for one semester comprising lectures, laboratory work and tutorials. Two hours lecture and one hour laboratory/tutorial per week.
Required Reading: Schach, S.R., 2010, 8th edn, Object Oriented and Classical Software Engineering, McGraw Hill.
Assessment: Students must pass all components of assessment to gain a pass in the unit. Assignment, 10-15 page solution to the assignment problem., 30%. Examination, 3 hours written examination, 70%. Assignment assesses Learning Outcomes 1, 2 and 3 and Graduate Capabilities 1-6 Examination assesses Learning Outcomes 1, 2 and 3 and Graduate Capabilities 1, 2, 4,5,6 .

RCM6842 ADVANCED TOPICS IN SOFTWARE ENGINEERING

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM6844 - SOFTWARE ENGINEERING 1
Description: Advanced software engineering topics recently emerged in the research literatures, issues and applications of these software engineering approaches. Example topics including agent oriented software engineering, software as a service (cloud computing), super agile software development and etc.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Explore and acquire knowledge and skills of advanced software engineering approaches through research literature and other resources;
- Evaluate software engineering approaches, including recently emerged software engineering approaches in application context;
- Design and develop software applications by applying the newly emerged software engineering models, such as software agent models.

Class Contact: Thirty six (36) hours for one semester comprising lectures and labs. 3 hours per week: Two hour lecture and one hour laboratory.
Required Reading: Research articles and other materials will be provided by the lecturer.
Assessment: Four to six labs on selected advanced SE topics: 50%; assignment: 50%. Laboratory Work, Four to six labs on selected advanced SE topics, 50%. Assignment, Assignment project applying selected advanced SE approach (About 1500 lines of code)., 50%. Laboratory Work assesses Learning Outcomes (1, 2, 3) and Graduate Capabilities (1,2,3,4,5,6) Assignment assesses Learning Outcomes (1,2,3) and Graduate Capabilities (1,2,3,4,5,6) .

RCM6843 SOFTWARE ENGINEERING PROJECT

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM6844 - SOFTWARE ENGINEERING 1
Description: This is a project based unit. Each student will work on a project as a member of a software development team, or on a personal software project. Each project will focus on an industrial and business application such as computer games, financial systems, medical information systems, etc. Each project requires the application of knowledge and skills in one or more of the computing and software engineering areas including user interface development, database management systems, networking, wireless/ mobile computing, web based and general application development environments. Each project practices the software engineering process, generating work products of requirement document, design document, testing report, system manual, project plan and progress log.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Develop and manage software development process for software projects
- Design and develop software systems in a systematic approach
- Develop one software application with strong industrial background such like computer games, financial systems, medical information systems, etc
- Apply knowledge and skills in the computing and software engineering to the development of software projects, including user interface development, database management systems, networking, wireless/ mobile computing, web based and general application development environments.

Class Contact: Thirty six (36) hours over one 12-week semester comprising of three (3) hours project session per week.
Required Reading: Project guideline.
Assessment: System (project) analysis and design: 50% Final system (project) evaluation: 50% Lecturer will allocate students in either individual projects or group projects. Individual projects are about 500-1000 Lines of Code (LOC); group projects are about 1500-2000 LOC. Project, Development of a software project in a simulated or real industry client's environment . , 100%. Project assesses Learning Outcomes (1, 2, 3) and Graduate Capabilities (1,2,3,4,5,6) .

RCM6844 SOFTWARE ENGINEERING 1

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5800 - OBJECT ORIENTED PROGRAMMING GD1
Description: This unit covers software engineering knowledge in areas of software management, software verification and validation. Review topics including software process and software life-cycle models, software process improvement, requirement, classical analysis and design, object oriented analysis and design. Detailed topics include inspection, review, control flow testing, boundary testing, FSM testing and integration tests.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Develop proper solutions for software review and inspection, including estimation to the cost effectiveness of reviews;
- Develop test cases for software applying variety of testing techniques including control flow testing, boundary testing, equivalence class testing and FSM testing;

- Develop integration testing strategies.

Class Contact: Thirty six (36) hours for one semester comprising lectures and laboratories/tutorials. 3 hours/week: two hour lectures and one-hour laboratory/tutorial
Required Reading: Materials will be distributed by the lecturer.
Assessment: Students must obtain at least 40% standard in the assignment and at least 40% on the final examination, and obtain an overall mark of 50%. Assignment, Design software review and testing solutions for given software (about 20 pages). , 30%. Examination, Three hour written examination, 70%. Assignment assesses: Learning Outcomes (1,2,3) and Graduate Capabilities (1,2,3,4,5,6) Examination assesses: Learning Outcomes (1, 2, 3) and Graduate Capabilities (1,2,4,5,6) .

RCM6845 OBJECT ORIENTED TECHNOLOGY

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5824 - OBJECT ORIENTED PROGRAMMING GD2
Description: JavaBeans Component Model - Overview, Introspection, Properties of Beans; Networking - InetAddress Class, URL Class, URLEncoder Class, URLConnection Class, Sockets, Server Sockets, Datagram Clients/Servers; Servlet overview and architecture, HttpServlet Class, HttpServletRequest Interface, HttpServletResponse Interface, Handling HTTP get and post Requests, setting up the Apache Tomcat Server, deploying a web application, session tracking; JSP Overview, scripting components, standard actions, directive, custom tag libraries; EJB Overview, session beans, EJB transactions.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Design and develop advanced web applications using Java technologies;
- Design and develop enterprise wide applications using Enterprise Java Beans.

Class Contact: Thirty six (36) hours for one semester comprising lectures and laboratories/tutorials. 3 hours/week: two hour lectures and one-hour laboratory/tutorial
Required Reading: Deitel, H.M., Deitel, P.J., (2011). (9th ed.). Java How to Program. Prentice Hall.
Assessment: Students must obtain at least 40% standard in the practicals and assignment and at least 40% on the final examination, and obtain an overall mark of 50%. Assignment, Design and development of a software system using advanced Java technologies (about 1000 lines of code), 30%. Examination, Three hour written examination, 70%. Examination assesses: Learning Outcomes (1, 2, 3) and Graduate Capabilities (1,2,4,5,6) Assignment assesses: Learning Outcomes (1,2,3) and Graduate Capabilities (1,2,3,4,5,6) .

RCM6846 OBJECT ORIENTED DESIGN

Locations: Footscray Park, VU Sydney.
Prerequisites:RCM5824 - OBJECT ORIENTED PROGRAMMING GD2Or equivalent unit to be determined by Unit coordinator.
Description: Unified Modeling Language (UML); Introduction to Rational Rose; Unified Method and the design of the domain layer; Concepts of persistence and transactions in an OO context; Interaction layer design considerations; Implementation and deployment models; Packages, subsystems and models; Design patterns and frameworks.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Design software systems using the Unified Modelling Language;
- Apply the different types of models of the Unified Modelling Language to design of software systems;
- Apply patterns and frameworks to the design of software systems.

Class Contact: Thirty-six (36) hours for one semester comprising lectures, tutorials and laboratory sessions.
Required Reading: Priestley, M. (2007). (2nd ed.). Practical Object-Oriented Design with UML. McGraw Hill.
Assessment: Students must obtain at least 40% standard in the assignment and at least 40% on the final examination, and obtain an overall mark of 50%. Assignment, Two assignments (6 hours), 30%. Examination, Final examination (3 hours), 70%. Assignments assess: Learning Outcomes 1, 2 and 3 and Graduate Capability 1 & 5. Examination assesses: Learning Outcomes 1, 2 and 3 and Graduate Capability 1 & 5.

RCM6902 MATHEMATICAL PROGRAMMING 1

Locations: Footscray Park.
Prerequisites: Consent of lecturer.
Description: Overview of mathematical programming; review of linear constraints, convexity; the primal and dual problems; the simplex method, slack variables, optimality, post-optimality and sensitivity analysis, integer (linear) programs; commercial packages for mathematical programming, Applied LP Models.
Credit Points:12
Class Contact: Three hours per week for one semester comprising lectures/tutorials.
Required Reading: To be advised by lecturer.
Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

RCM6904 SIMULATION

Locations: Footscray Park.
Prerequisites: Nil.
Description: Problem formulation using the concepts of entities, attributes, files, events etc. Generating random numbers from discrete and continuous distributions. Practical coding experience using SLAMII including debugging and verifying that the translated model executes as intended. Systems approach, flow diagram and problem analysis for discrete event systems. Network modelling involving queuing, resources, pre-emption, priorities and machine breakdown. Design and analysis of simulation experiments. Practical coding experience using SLAMII.
Credit Points:12
Class Contact: Three hours per week for one semester comprising lectures/tutorials.
Required Reading: To be advised by lecturer.
Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

RCM6905 SEQUENCING AND SCHEDULING

Locations: Footscray Park.
Prerequisites: Nil.
Description:A selection of topics from the following. Standard Flow Shop and Job

Shop Scheduling Techniques, Project Scheduling and Management-Finding a critical path, PERT calculations, Time/Cost Trade-offs in reducing total project time, Crashing and indirect costs, Time-Charting and Resource leveling, Use of MSProject, EXCEL and Leuin Scheduling Systems. Project Risk Analysis. Materials Requirement Planning, Current Trends in Scheduling and real-Time Computing Systems. Emphasis will be on real-world

Credit Points:12

Class Contact: Three hours per week for one semester comprising lectures and tutorials.

Required Reading: To be advised by lecturer.

Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

RCM6906 OPTIMISATION TECHNIQUES

Locations: Footscray Park.

Prerequisites:RCM1613 - APPLIED STATISTICS 1

Description: Lecture Program Topics: Decision Tree and AHP; Maximal flow problems, Shortest-route problem, Minimal spanning tree problem, Estimating network flows; Queuing. Theory; Combinatorial Models: CSP, SCP, & BPP. Spreadsheet Analysis.

Credit Points:12

Class Contact: Three hours per week for one semester comprising lectures/tutorials.

Required Reading: To be advised by lecturer.

Assessment: Will be based on a combination of examination, assignments, tests and presentations according to a formula to be provided during the first week of classes.

RCM8001 RESEARCH THESIS 1 FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:48

RCM8002 RESEARCH THESIS 2 FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:48

RCM8011 RESEARCH THESIS 1 PART TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:24

RCM8012 RESEARCH THESIS 2 PART TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:24

RCS1000 MEDICAL, FORENSIC AND ANALYTICAL CHEMISTRY 1

Locations: Werribee.

Prerequisites: Nil.

Description: Overview and introduction to the principles and methodology of medical, forensic and analytical chemistry. Medical chemistry: introduction to medical therapeutics and diagnostics, organic and inorganic medical chemistry, nuclear medicine and drug design. Forensic chemistry: introduction to physical evidence, fire and explosion investigation, firearm investigation, drug analysis and the analysis of chemical evidence such as fibres. An introduction to the relevant areas of analytical chemistry include an overview of measurements in the analytical laboratory, solutions and concentrations, and an introduction to classical analytical chemistry including volumetric analysis and methods based on analytical separations.

Credit Points:12

Class Contact: Three hours of lectures and one hour of tutorials/demonstrations per week.

Required Reading: Chang, R., Essential Chemistry, 3rd edition, McGraw-Hill.
Saferstein, R., Criminalistics: An Introduction to Forensic Science, 8th edition, Prentice-Hall.

Assessment: Written examination, 100%.

RCS1110 CHEMISTRY FOR BIOLOGICAL SCIENCES A

Locations: St Albans.

Prerequisites: Nil.

Description: In this unit students will learn about basic chemistry properties,actions and reactions. In particular, there will be emphasis on matter and energy, atomic theory and the periodic table, solutions and aqueous chemistry. Students will have the opportunity to conduct basic experiments utilizing a range of chemical formulas in science labs, , chemical formulas, reactions and equations, gas laws and the state of matter, solutions and aqueous chemistry. In this unit students will learn about basic chemistry including the topics which follow: Matter and energy, measurement, chemical and physical bonding, reactions and equations, solutions and aqueous chemistry.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Define basic chemical principles and practices. 2. Apply the principles of atomic theory, the periodic table and the mole concept to solve basic chemical problems 3. Demonstrate the skills required to prepare solutions and aqueous solutions as a member of a laboratory team. 4. Apply the principles of gas laws to solve chemical problems.

Class Contact: Seventy two (72) hours for one semester comprising lectures, tutorials and practical classes.

Required Reading: Bettelheim, F.A., Brown, W.H., Campbell, M.K. and Farrell S.O., 2009, 10th edn Introduction to General, Organic and Biochemistry South Melbourne: Cengage Education.

Assessment: Exercise, Submit one question per week (Calculations not more than one page), 10%. Laboratory Work, Nine lab summary (calculations and questions between two to three pages per week), 20%. Examination, Three hour final exam, 60%. Test, 30 minutes, 10%. Exercise assess Learning Outcomes 1,2 and 5 and Graduate Capabilities 1 and 2 Laboratory work assesses Learning Outcomes 1-4 and Graduate Capabilities 1, 2 and 4 Examination assesses Learning Outcomes 1-4 and Graduate Capabilities 1, 2 , 3 and 5 Test assesses Learning Outcomes 1-4 and Graduate Capabilities 1, 2 , 3 and 5.

RCS1120 CHEMISTRY FOR BIOLOGICAL SCIENCES B

Locations: St Albans.

Prerequisites:RCS1110 - CHEMISTRY FOR BIOLOGICAL SCIENCES AOr equivalent to be determined by Unit coordinator.

Description: This unit serves as an introduction to chemistry relevant to biological sciences and in particular biological systems. The unit will cover the principles of basic physical chemistry including chemical equilibrium and kinetics, acids and bases, thermochemistry and nuclear chemistry. How biological chemistry relates to organic chemistry will also be investigated.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply the principles of chemical kinetics and equilibrium to laboratory practices. 2. Determine the concentrations and pH of acids and bases. 3. Identify and understand the principles of organic chemistry, biological, nuclear, and thermo chemistry and how they interact with each other. 4. Apply the principles of organic and biological chemistry to solve problems in laboratory settings. 5.Reflect on how knowledge and skills in chemistry adds value to career options in the biomedical sciences

Class Contact: Seventy two (72) hours for one semester comprising three hours of lectures, one hour tutorial and two hours practical classes.

Required Reading: Bettelheim, F.A., Brown, W.H. and March, J., 2011 10th Introduction to General, Organic and Biochemistry Harcourt College Publishers

Assessment: Exercise, One tutorial question per week (Calculation of not more than one page), 10%. Laboratory Work, Nine lab summary (questions and calculations, between 2-3 pages per week), 20%. Examination, Final 3 hour examination, 60%. Test, 30 minutes, 10%. Exercise assess Learning Outcomes 1,2 and 5 and Graduate Capabilities 1 and 2 Laboratory work assesses Learning Outcomes 1-4 and Graduate Capabilities 1, 2 and 4 Examination assesses Learning Outcomes 1-4 and Graduate Capabilities 1, 2 , 3 and 5 Test assesses Learning Outcomes 1-4 and Graduate Capabilities 1, 2 , 3 and 5.

RCS1601 CHEMISTRY 1A

Locations: Footscray Park.

Prerequisites: Nil.

Description: Chemistry methods and measurements; atomic theory and the periodic table; structures and properties of ionic and covalent compounds; chemical equation, reactions and solutions; co-ordination chemistry, acids and bases.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify the elements in the periodic table and state their properties in relation to their position in the periodic table;
- Identify the types of bonds (ionic and covalent) and, using the concept of Lewis structure and VSEPR, draw the geometry of the molecules;
- Describe the mole concept and its relationship to Avagadro's number;
- Draw and complete stoichiometric equations;
- Identify the geometry of various coordination complexes and indicate the structural name of these complexes;
- Identify the various types of chemical reactions (precipitation reactions, acid-base reactions and redox reactions).

Class Contact: Eight-four (84) hours or equivalent for one semester comprising lectures, tutorials and laboratories.

Required Reading: Chang, R. (2000). Essential chemistry (2nd ed.). McGraw-Hill. Laboratory manuals as directed.

Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Laboratory Work, Laboratory Work, 30%. Tutorial Participation, Assessments, 15%. Examination, Internal, 55%.

RCS1602 CHEMISTRY 1B

Locations: Footscray Park.

Prerequisites: Nil.

Description: States of matter; physical and chemical changes (energy, rate and equilibrium); oxidation-reduction reaction (electrochemistry); the nucleus, radioactivity and nuclear medicine. Organic chemistry: saturated and unsaturated hydrocarbons; alcohol phenols, thiols and ethers; aldehydes and ketones; carboxylic acids and their derivatives; amines and amides; biological chemistry.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify the various states of matter (gaseous, liquid and solid) and to state the various properties and intermolecular interactions of these states;
- Cite the first law of thermodynamics including enthalpy of chemical reactions, calorimetry, standard enthalpy of formation and reaction and the concept of Hess's law;
- Identify the equilibrium constant for a variety of chemical reactions;
- Identify the various factors that influence the rate of a chemical reaction;
- Complete nuclear equations and state the factors affecting nuclear stability;
- Identify the various functional groups associated with organic molecules.

Class Contact: Eight-four (84) hours or equivalent for one semester comprising lectures, tutorials and laboratories.

Required Reading: Chang, R. (2000)., Essential cChemistry (2nd ed.). McGraw-Hill(A Core Text for General Chemistry), 2nd edn, McGraw Hill. Laboratory manuals as

directed.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Other, Practical Work, 30%. Tutorial Participation, Assessments, 15%. Examination, Examination, 55%.

RCS2100 ORGANIC CHEMISTRY 2A

Locations: Werribee.
Prerequisites:RCS1602 Chemistry 1B
Description: The aims of this unit are to introduce students to fundamental aspects of synthetic organic chemistry, organic reaction mechanisms along with applications of spectroscopy to organic chemistry. The topics covered include: aromaticity, electrophilic and nucleophilic aromatic substitution reactions. The chemistry of carbanions and of carbocations. Practical exercises providing substantial 'hands-on' experience with chromatographic and spectroscopic instrumentation will complement the lecture material.
Credit Points:12

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to:

- use mechanisms to explain simple organic chemical reactions;
- describe the factors which control simple organic reactions;
- characterise aromatic compounds and describe their common reactions;
- provide examples of simple reactions involving carbanions and carbocations;
- perform common practical organic chemistry manipulations.

Class Contact: Two hours of lectures and three hours of practical classes per week for one semester.
Required Reading: Morrison, R.T., and Boyd, R.N., 1992, Organic Chemistry, 6th edn, Prentice Hall.
Assessment: End-of-semester examination, 70% (P2, I2, W2); Practical work, 20% (P2, A2, I2, W2, O2); Assignment, 10% (P2, I2).

RCS2200 ORGANIC CHEMISTRY 2B

Locations: Werribee.
Prerequisites:RCS1602 - CHEMISTRY 1B
Description: The aims of this unit are to build upon the concepts introduced in RCS2100 Organic Chemistry 2A. Topics covered will include: the chemistry of free radicals; an introduction to polymer chemistry; photochemistry and molecular orbital reactions and an introduction to the design of synthetic sequences. Practical exercises providing substantial 'hands-on' experience with chromatographic and spectroscopic instrumentation will complement the lecture material.
Credit Points:12

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to:

- define free radicals and explain their common reactions;
- describe and explain basic polymers, their preparation and properties;
- describe and evaluate photochemical and pericyclic reactions;
- utilise the disconnection approach to devise practical syntheses of simple organic compounds.

Class Contact: Two hours of lectures and three hours of practical classes per week for one semester.
Required Reading: Morrison, R.T., and Boyd, R.N., 1992, Organic Chemistry, 6th edn, Prentice Hall.
Assessment: End-of-semester examination, 70% (P2, I2, W2); Practical work, 20% (P2, A2, I2, W2, O2); Assignment, 10% (P2, I2).

RCS2502 MEDICAL CHEMISTRY 2

Locations: Werribee.
Prerequisites: Nil.
Description: The aim of this subject is to introduce students to aspects of Medical Chemistry. The topics covered include Nuclear Chemistry and the application of Radioisotopes in Medical Chemistry. Bioinorganic Chemistry and the role of inorganic compounds in medicine. The synthesis and analysis of proteins, the structure and physiology of carbohydrates and lipids and a brief introduction to drug/molecule interactions.
Credit Points:12

Learning Outcomes: At the conclusion of this unit students will be able to:

- discuss the importance of medical inorganic chemistry and minerals in health;
- identify the structure carbohydrates and lipids; and explain their analysis;
- characterise amino acids and proteins and explain their preparation, analysis and basic structure;
- discuss the principles behind drug-protein interactions.

Class Contact: Two hours of lectures and three hours of practical classes per week for one semester.
Required Reading: Morrison, R.T., and Boyd, R.N., 1992, Organic Chemistry, 6th edn, Prentice Hall.
Assessment: End-of-semester examination, 80%; practical work 20%.

RCS2503 FORENSIC CHEMISTRY 2

Locations: Werribee.
Prerequisites:RCS1601 Chemistry 1A or RCS1602 Chemistry 1B or equivalent.
Description: Forensic Chemistry 2 introduces students to forensic chemical techniques as applied to the analysis of physical evidence collected from crime scenes. Topics covered include: introduction to physical evidence, arson investigation, forensic drug analysis and environmental forensics. Practical exercises provide 'hands-on' experience in a range of forensic chemical techniques.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Describe the nature of fire and how materials burn;
- Describe current practices in arson investigation including taking samples, recovery and gas chromatographic analysis of ignitable liquid residues and identification of accelerants;
- Describe analytical procedures to investigate environmental pollutants;
- Describe screening procedures for drugs in forensic samples;
- Develop extraction procedures for drugs and metabolites in biological samples;

- Perform a number of forensic analyses including Duquenois-Levine test for marijuana, fingerprinting, Plaster of Paris casts of footprints, colour tests for drugs in white powders, drug analysis using IR and UV-Vis spectrophotometry, inks by TLC, alcohol by GC and metal poisons by AA.

Class Contact: Sixty (60) hours per semester comprising lectures and practicals.
Required Reading: R. Saferstein, 2007 9th ed An Introduction to Forensic Science New Jersey, Pearson Education P. White, 2004 2nd ed Crime Scene to Court: The Essentials of Forensic Science Cambridge, Royal Society of Chemistry A. Langford, J. Dean, R. Reed, D. Holmes, J. Weyers and A. Jones, 2005 1st ed Practical Skills in Forensic Science Essex, Pearson Education
Assessment: A combination of assignments, 15%; practical work, 30%; and examination, 55%. Assignment, Written Assignment (5000 words), 15%. Laboratory Work, Complete laboratory data sheet for each experiment, 30%. Examination, Two hour theory examination, 55%.

RCS2601 ANALYTICAL CHEMISTRY 2A

Locations: Werribee.
Prerequisites: RCS1601 - CHEMISTRY 1ARCS1602 - CHEMISTRY 1B
Description: Statistics of errors and treatment of analytical data. Sampling of complex materials. Analytical methods based on emission and absorption of radiation including UV visible and fluorescence spectroscopy. Introduction to NMR and mass spectrometry. Practical exercises will provide substantial 'hands on' experience with modern analytical instruments and will illustrate important analytical and physicochemical techniques.
Credit Points: 12
Class Contact: Two hours per week of lectures and three hours of laboratory classes per week for one semester.
Required Reading: Students should possess a good basic analytical chemistry text such as Skoog, D.A., West, D.M. and Holler, F.J., Fundamentals of Analytical Chemistry, Holt Rinehart and Winston. Students are advised to buy one of the following as a reference of enduring value. Bauer, H.H., Christian, C.D.E. and O'Reilly, J.E., Instrumental Analysis, Allyn and Bacon. Skoog, D.A. and Leary, J.J., Principles of Instrumental Analysis, Saunders. Willard, H.W., Merritt, H.G., Dean, J.A. and Settle, F.A., Instrumental Methods of Analysis, Wadsworth.
Assessment: Students will be assessed on the basis of an examination, 70%; and practical work, 30%. Students must pass the practical component in order to pass this subject.

RCS2602 ANALYTICAL CHEMISTRY 2B

Locations: Werribee.
Prerequisites: RCS1601 - CHEMISTRY 1ARCS1602 - CHEMISTRY 1B
Description: Prinicples of instrumentation. Chromatographic methods including gas chromatography and liquid chromatography. Introduction to electrochemical methods. Analytical separation techniques and processes. Practical exercises will provide substantial 'hands on' experience with modern analytical instruments and will illustrate important analytical and physiocochemical techniques.
Credit Points: 12
Class Contact: Two hours per week of lectures and three hours of laboratory classes per week for one semester.
Required Reading: Students should possess a good basic analytical chemistry text such as Skoog, D.A., West, D.M. and Holler, F.J., Fundamentals of Analytical Chemistry, Holt Rinehart and Winston. Students are advised to buy one of the following as a reference of enduring value. Bauer, H.H., Christian, C.D.E. and O'Reilly, J.E., Instrumental Analysis, Allyn and Bacon. Skoog, D.A. and Leary, J.J., Principles of Instrumental Analysis, Saunders. Willard, H.W., Merritt, H.G., Dean, J.A. and Settle, F.A., Instrumental Methods of Analysis, Wadsworth.
Assessment: Students will be assessed on the basis of an examination, 70%; and practical work, 30%. Students must pass the practical component in order to pass this subject.

RCS3000 INDUSTRIAL EXPERIENCE 3A

Locations: Werribee.
Prerequisites: Nil.
Description: No formal content; students will be required to provide evidence of 12months full-time (or equivalent part-time) employment in a Chemical Industry acceptable to the Head of School. Students should consult with appropriate staff prior to commencing the subject to ensure their situation is acceptable to the School.
Credit Points: 12
Class Contact: Class Contact No set contact hours.
Assessment: Evidence of appropriate industrial experience in the form of a letter from the employer detailing the experience is required.

RCS3411 ENVIRONMENTAL LEGISLATION

Locations: St Albans.
Prerequisites: Nil.
Description: Philosophy of pollution control and control regulations. Environmental legislation and its implementation. Environmental law in Victoria. Environmental impact statements. Social, economic and political factors. Case studies.
Credit Points: 12
Class Contact: Four hours of lectures per week for one semester.
Required Reading: To be advised by lecturer.
Assessment: Fieldwork and assignments, 40%; examinations, 60%.

RCS3601 ANALYTICAL CHEMISTRY 3A

Locations: Werribee.
Prerequisites: RCS2601 - ANALYTICAL CHEMISTRY 2AOR RCS2602 Analytical Chemistry 2B
Description: Chemical literature and use of library resources; modern trends in chemical analysis; review of analytical methodologies; an operational model for analytical chemistry; evaluation and criticism of analytical results; development of new analytical methods and trends in analytical research; project planning; selection and purchase of analytical equipment and apparatus; optimisation of analysis. Applications of advanced spectroscopy to organic analysis and structure elucidation. Analysis of carbohydrates, lipids, terpenes, steroids, heterocyclic compounds and proteins.
Credit Points: 12
Class Contact: Two hours of lectures per week and four hours of laboratory classes per week for one semester.
Required Reading: Students are advised to buy one of the following as a reference of enduring value: Christian, C.D.E. and O'Reilly, J.E. Instrumental Analysis, Allyn and Bacon. Skoog, D.A. and Leary, J.J., Principles of Instrumental Analysis, Saunders. Willard, H.W., Merritt, H.G., Dean, J.A. and Settle, F.A. Instrumental Methods of Analysis, Wadsworth.
Assessment: Students will be assessed on the basis of an examination, 70%; and practical work, 30%. Students must pass the practical component in order to pass this subject.

RCS3602 ANALYTICAL CHEMISTRY 3B

Locations: Werribee.

Prerequisites:RCS2601 - ANALYTICAL CHEMISTRY 2AOR RCS2602 Analytical Chemistry 2B

Description: Principles, instrumentation, interferences and applications in chemical analysis of absorption and emission spectroscopy including vibrational, rotational, advanced UV visible and fluorescence spectroscopy, and flameless AAS. Electrochemical methods of analysis including ion-selective electrodes, and modern polarography and stripping volumetry. Flow injection analysis. Capillary electrophoresis. Specialized physical techniques of analysis including thermal methods, techniques for surface analysis and the analysis of polymer molecular weights. Practical work providing substantial 'hands on' experience will complement the lecture material.

Credit Points:12

Class Contact: Two hours of lectures per week and four hours of laboratory classes per week for one semester.

Required Reading: Students are advised to buy one of the following as a reference of enduring value: Christian, C.D.E. and O'Reilly, J.E. Instrumental Analysis, Allyn and Bacon. Skoog, D.A. and Leary, J.J., Principles of Instrumental Analysis, Saunders. Willard, H.W., Merritt, H.G., Dean, J.A. and Settle, F.A. Instrumental Methods of Analysis, Wadsworth.

Assessment: Students will be assessed on the basis of an examination, 70%; and practical work, 30%. Students must pass the practical component in order to pass this subject.

RCS3603 MEDICAL CHEMISTRY 3 A

Locations: Werribee.

Prerequisites:RCS2100 - ORGANIC CHEMISTRY 2A

Description: The synthesis of new chemicals and biochemicals which mimic natural molecules. Methods used to assess the purity of synthetically generated products. Methods used for the bioassay of chemically synthesized chemical. The design of chemicals using 3D drug design.

Credit Points:12

Learning Outcomes: At the conclusion of this unit students will be able to:

- apply the principles of various organic synthetic procedures to drug synthesis;
- categorise the different classes of protecting groups and describe their role in organic synthesis;
- evaluate various chiral synthetic methodologies and their application to drug synthesis;
- discuss the importance of X-Ray diffraction and its application to determining the structure of small molecules and proteins;
- describe the fundamentals of protein chemistry in relation to the isolation and purification of proteins;
- discuss the principles and application of combinatorial synthesis;
- utilise basic computer modelling as applied to drug design.

Class Contact: Two hours of lectures and four hours of practical classes per week.

Required Reading: Morrison, R.T., and Boyd, R.N., 1992, Organic Chemistry, 6th edn, Prentice Hall.

Assessment: Practical work, 40%; final examination, 60%.

RCS3604 MEDICAL CHEMISTRY 3 B

Locations: Werribee.

Prerequisites:RCS2502 Medical Chemistry 2.

Description: Students enrolled in medical chemistry 3 will become skilled in the use of the theoretical basis of advanced physico-chemical and biochemical methods for body fluid analysis for the diagnosis of human diseases. These techniques will include ELISA assays and the analysis of human tissues using techniques such as PCR to determine the DNA profile of human tissues.

Credit Points:12

Class Contact: Two hours of lectures and four hours of practical classes per week.

Required Reading:A range of textbooks and journal articles will be recommended by the lecturer.

Assessment: Practical work, 40%; examinations, 60%.

RCS3605 FORENSIC METHODS 3A

Locations: Werribee.

Prerequisites:RCS2503 - FORENSIC CHEMISTRY 2Or equivalent to be determined by Unit coordinator.

Description: Forensic Methods 3A builds upon the concepts introduced in Forensic Chemistry 2 and provides training in sophisticated methods of analysis as currently applied to the examination of materials that have in some way been associated with crime. Topics covered include: firearm investigation, gun shot residue analysis, chemical fingerprinting and the forensic analysis of drugs, paints and pesticides. Practical exercises provide 'hands-on' experience in a range of forensic chemical techniques.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply the principles of chemical fingerprinting including identifying oil from oil spills and using isotopic ratios to authenticate foodstuffs;
- Describe the practice of GSR analysis including sampling, bulk analysis, particle analysis and development of powder patterns;
- Develop analytical procedures for drugs in forensic samples;
- Describe the role of modern techniques such as GC, pyrolysis GC and energy dispersive x-ray analysis as applied to samples of forensic interest such as paint and pesticides in foodstuffs;
- Perform a number of forensic analyses including GSR on hands using ICPAES, quinine in urine by fluorometry, drugs in white powders by HPLC, forensic applications of LCMS and GCMS, ignitable liquids in fire debris by GC, IR microscopy of fibres, opiates in opium powder by GCMS and refractive index of glass.

Class Contact: Sixty (60) hours per semester comprising lectures and practicals.

Required Reading:R. Saferstein, 2007 9th ed An Introduction to Forensic Science New Jersey, Pearson Education P. White, 2004 2nd ed Crime Scene to Court: The Essentials of Forensic Science Cambridge, Royal Society of Chemistry A. Langford, J. Dean, R. Reed, D. Holmes, J. Weyers and A. Jones, 2005 1st ed Practical Skills in Forensic Science Essex, Pearson Education

Assessment: Practical work, 30%; and examination, 70%. Laboratory Work, Complete lab data sheet for each experiment, 30%. Examination, Three hour theory examination, 70%.

RCS3606 FORENSIC METHODS 3B

Locations: Werribee.

Prerequisites:RCS2503 - FORENSIC CHEMISTRY 2Or equivalent to be determined by Unit coordinator.

Description: Forensic Methods 3B provides training in sophisticated methods of analysis as currently applied to the examination of materials that have in some way been associated with crime. Various topics in this subject will be delivered by practicing forensic scientists. These include crime scene investigation, chemical trace evidence, fire and explosion investigation, fingerprints, drug analysis, clandestine laboratory scene investigation, forensic toxicology and DNA profiling. Legal studies is also included and introduces students to the legal system, courtroom practices and expert testimony. Practical exercises provide 'hands-on' experience in a range of forensic chemical techniques.
Credit Points: 12

Learning Outcomes: At the conclusion of this unit students will be able to:

- discuss important considerations in the examination of different types of physical evidence;
- describe the role of DNA profiling in forensic science; describe the nature of molecular markers and carry out laboratory procedures related to the above such as DNA amplification and separation;
- define the role of forensic science within the legal system;
- perform a number of forensic analyses including GSR on hands using FAAS, quinine in urine by fluorimetry, drugs in white powders by HPLC, ignitable liquids in fire debris by GC, IR microscopy of fibres, opiates in opium powder by GCMS, refractive index of glass, DNA isolation, amplification and separation of PCR products using electrophoresis.

Class Contact: Two hours of lectures and three hours of practical classes per week for one semester.
Required Reading: Saferstein, R., Criminalistics - An Introduction to Forensic Science, Pearson Education, New Jersey, 9th ed., 2007. White, P., (ed), Crime Scene to Court: The Essentials of Forensic Science, Royal Society of Chemistry, Cambridge, 2nd ed., 2004.
Assessment: Practical work, 30%; and assignments/examination, 70%.

RCS3607 ADVANCED ANALYTICAL ANALYSES

Locations: Werribee.
Prerequisites: RCS3601 Analytical Chemistry 3A
Description: This subject will introduce FT-NMR and associated techniques, 13C NMR, decoupling, relaxation, nOe's and DEPT. The role and interpretation of 2D NMR experiments such as COSEY, HSBC and NOESY. The use of LC/MS and MSn in the identification and characterisation of a range of chemical classes will be discussed. Particular emphasis will be placed upon single ion monitoring and fragment monitoring. Other techniques including fluorescence spectroscopy and its role in chemical analysis will also be discussed.
Credit Points: 6
Learning Outcomes: To provide students with an understanding of the design, interpretation and application of a range of advanced analytical techniques.
Class Contact: 2 hrs of lectures per week
Required Reading: Spectrometric Identification of Organic Compounds by Robert M. Silverstein, Francis X. Webster, Wiley; 6th edition, ISBN: 0471134570.
Assessment: Assessed by two assignments and a written examination. Each assignment is worth 20% and has a 1000 word limit and may be supplemented with an appropriate number of figures, charts and/or tables. The assignments will be spread evenly over the semester. The written examination is worth 60% and there are no specific conditions for the exam.

RCS3608 POLYMER TECHNOLOGY

Locations: Werribee.
Prerequisites: RCS2200 - ORGANIC CHEMISTRY 2B
Description: This unit will introduce students to the preparation of polymers, including radical and ionic polymerisation as applied to chain reaction and step reaction polymerisation reactions. The determination of polymer molecular weight and analysis using GPC will be presented. The physical properties of polymers and their importance to the plastics industry will also be a focus of this subject.
Credit Points: 6
Learning Outcomes: To provide students with an understanding of polymer chemistry as it relates to the plastics industry.
Class Contact: 2 hrs of lectures per week
Required Reading: Polymer Chemistry: An Introduction, 3rd edition. By Malcolm P. Stevens. Oxford University Press: New York, Oxford. $70.00. ISBN 0-19-512444-8.
Assessment: Assessed by one assignment and a written examination. The assignment is worth 30% and has a 1000 word limit and may be supplemented with an appropriate number of figures, charts and/or tables. The written examination is worth 70% and there are no specific conditions for the exam.

RCS4201 HONOURS COURSEWORK

Locations: Werribee.
Prerequisites: Nil.
Description: The major focus of the course component is research methodology and subjects include experimental design, statistics in research, data analysis, computer applications and software, literature analysis and critical appraisal, ethics in research, scientific writing and data presentation.
Credit Points: 24
Class Contact: An average of 10 hours per week
Required Reading: To be advised by the lecturer.
Assessment: The assessment will vary and may be based on written assignments, seminar presentations and a written examination.

RCS4601 HONOURS PROJECT PART TIME

Locations: Werribee.
Prerequisites: Nil.
Description: The program will consist of a research project and a coursework component. The major focus of the course component is research methodology and subjects include experimental design, statistics in research, data analysis, computer applications and software, literature analysis and critical appraisal, ethics in research, scientific writing and data presentation. The research project will be undertaken in one of the research areas of the School and may, subject to approval, be undertaken at an external location.Required Reading To be advised by the lecturer. Normally the coursework component will be conducted in the first two semesters and the research component in the third and fourth semester.
Credit Points: 24
Class Contact: An average of 10 hours per week for four semesters.
Required Reading: To be advised by the lecturer. Normally the coursework component will be conducted in the first two semesters and the research component in the third and fourth semester.
Assessment: The nature of the coursework assessment will vary and may be based on written assignments, seminar presentations and a written examination. The research project assessment will consist of an oral presentation and submission of a thesis.

RCS4602 HONOURS PROJECT

Locations: Werribee.

Prerequisites: Nil.

Description: This subject, the aim of which is to enable students to competently research an area of study utilising knowledge and skills gained in previous studies, consists of a project carried out by students on an individual basis. The project is expected to be a scientific investigation of an approved topic, followed by the submission of a suitably formatted thesis in which the topic is introduced and formulated; the scientific investigation described in detail; results and conclusions from the study are elaborated; and an extended discussion presented. The research project will be undertaken in one of the research areas of the School and may, subject to approval, be undertaken at an external location.

Credit Points:48

Class Contact: An average of 30 hours per week for one semester

Required Reading: To be advised by supervisor.

Assessment: The assessment will consist of an oral presentation and submission of a thesis.

RCS4610 HONOURS PROJECT PART TIME

Locations: Werribee.

Prerequisites: Nil.

Description: This subject, the aim of which is to enable students to competently research an area of study utilising knowledge and skills gained in previous studies, consists of a project carried out by students on an individual basis. The project is expected to be a scientific investigation of an approved topic, followed by the submission of a suitably formatted thesis in which the topic is introduced and formulated; the scientific investigation described in detail; results and conclusions from the study are elaborated; and an extended discussion presented. The research project will be undertaken in one of the research areas of the School and may, subject to approval, be undertaken at an external location.

Credit Points:24

Class Contact: An average of 15 hours per week for one semester

Required Reading: To be advised by supervisor.

Assessment: The assessment will consist of an oral presentation and submission of a thesis.

RCS5111 PRINCIPLES OF ENVIRONMENTAL SCIENCE AND MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: Basic principles of environmental science. The physical, chemical and biological aspects of the atmosphere, hydrosphere and the geosphere. Distribution and transport of pollutants in and between the three systems. Causes and effects of environmental problems. Environmental fate of toxicants including bioconcentration and biomagnification. Application of toxicology in environmental science and management. Techniques in environmental impact assessment. Principles of resource management. Contaminated site assessment and restoration. Bioremediation. Environmental management systems. Current trends in environmental management. Social and economic aspects of environmental issues. Environmental ethics and economics.

Credit Points:12

Class Contact: Three hours of lectures per week for one semester.

Required Reading: There are no standard textbooks for this subject. Reading to be advised by the lecturer.

Assessment: Assessment will be by four assignments (4 x 10% = 40%) and one end of semester exam (60%). Each assignment has a 1,000 word limit (no more than 10 pages) and may be supplemented with an appropriate number of figures, charts and/or tables. Assignments and assignment deadlines will be spread evenly across the semester. There are no special conditions for exams.

RCS5131 WATER POLLUTION MONITORING & LIQUID WASTE MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: The specific problems associated with pollution of the ocean, coastal regions, lakes, rivers and streams, reservoirs and ground water. Water quality monitoring and the statistical design of water quality monitoring programs. Sustainable water management techniques. The Geographical Information System. The nature and sources of liquid waste. Domestic and industrial liquid wastes. Sewage and sewage management infrastructure, including the grass filtration method. Inorganic and organic waste treatment in the lagoon and septic tank systems. Treatment plant design. Microbial breakdown of organic wastes. By-products of sewage treatment, tertiary treatment of effluent. Pathogens in wastewater. Algal blooms. Legislative considerations. Case studies.

Credit Points:12

Class Contact: Three hours of lectures per week for one semester.

Required Reading: There are no standard textbooks for this subject. Reading to be advised by the lecturer.

Assessment: Assessment will be by four assignments (4 x 10% = 40%) and one end of semester exam (60%). Each assignment has a 1,000 word limit (no more than 10 pages) and may be supplemented with an appropriate number of figures, charts and/or tables. Assignments and assignment deadlines will be spread evenly across the semester. There are no special conditions for exams.

RCS5132 ENVIRONMENTAL LAW AND STANDARDS 2

Locations: Footscray Park.

Prerequisites: Nil.

Description: Discharge licence, Water quality criteria, standards and objectives. Laws regarding solid waste disposal. Law enforcement. Case studies in Victoria.

Credit Points:12

Class Contact: Three hours of lectures per week for one semester.

Required Reading: Bates, G.M. 1983, Environmental Law in Australia, Butterworths, Melbourne. Gilpin, A. 1980, Environmental Policy in Australia, Queensland University Press, Brisbane.

Assessment: Continuous assessment by assignments, presentations and reports.

RCS5172 SOLID WASTE MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: Nature and sources of solid wastes; hazardous waste handling; incineration; landfills; other disposal alternatives; monitoring and control.

Credit Points:12

Class Contact: Three hours per week for one semester.

Required Reading: To be advised by lecturer.

Assessment: Assignment and site visit reports, 40%; examination, 60%.

RCS8001 RESEARCH THESIS 1 FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate

Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:48

RCS8002 RESEARCH THESIS 2 FULL TIME

Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:48

RCS8011 RESEARCH THESIS 1 PART TIME

Locations: Werribee, This unit is also available off-campus..
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem 3. expert cognitive, technical and creative skills to:

- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature

4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8. autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the College and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

RCS8012 RESEARCH THESIS 2 PART TIME

Locations: Werribee, This unit is also available off-campus..
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem 3. expert cognitive, technical and creative skills to:

- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature

4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8.

autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the College and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

REP1000 DIRECTED STUDIES IN PHYSICS

Locations: Footscray Park.
Prerequisites: There are no prerequisites for this subject but Year 11 or equivalent physics background is preferred.
Description:A selection of topics from the following:Kinematics and MechanicsThermodynamicsElectricity and MagnesismElectronicsOpticsWave Motion and SoundQuantum PhysicsNuclar Physics
Credit Points:12
Learning Outcomes: To introduce students to the principles and techniques of physics and their applicability. It is principally designed for students who do not have a strong physics background or those who do not intend to major in physics or the allied technologies. Alternatively it can be used by students seeking a basic knowledge and understanding of physics with a view to examining whether they wish to study physics further. The detailed curriculum for an individual student, or a group of students with a common background, will depend on their prior studies in the area and the prupose to which they wish to put the subject. The detailed content will, therefore, vary but will, in general be taught at a level equivalent to a standard first year physics subject in a technological degree.
Class Contact: Equivalent to 36 hours per semester of lecture/tutorial/demonstration and laboratory experiences per semester.
Required Reading: Giancoli, D.C., Physics for Scientists and Engineers with Modern Physics 3rd Edition Prentics Hall or equivalent.
Assessment:A series of regular assignments and tests as negotiated for each individual student or group of students with a similar background. the assessment regime will be equivalent to that for a first year physics subject in a technological degree.

REP1001 ENGINEERING PHYSICS 1A

Locations: Footscray Park.
Prerequisites: Nil.
Description: Physical Units and Dimensions: Physical quantities, system of units and standards, dimensions, unit conversion, significant figures.Mechanics:Scalars and vectors, displacement, velocity and acceleration, motion in one and two dimensions, force, Newton's laws of motion, friction, work and energy, conservation laws. Momentum and conservation laws, impulse and collisions, rotational motion, moments of inertia, centre of mass, torque, angular momentum, staticsWave Motion & Optics: SHM, damped harmonic motion, forced oscillations and resonance, oscillatory motion, mechanical and acoustic waves, superposition and standing waves, electromagnetic waves, reflection and refraction of light, mirrors and lenses, wave optics, thin films, polarization.Fluids: Density, pressure, Pascal's law, equation of continuity, Bernouill's equation.
Credit Points:12
Class Contact: Students will be required to use the text book (required reading) extensively.
Required Reading: Giancoli, D.C. Physics for Scientists and Engineers with Modern Physics, 3rd Edition, 2000, Prentice HallEngineering Physics !A Laboratory Manual Victoria University.
Assessment: Class tests conducted throughout the semester (5 x 4% tests), 20%; Laboratory performance (5 x 4% laboratories during the semester), 20%; End of semester examination 60%.

REP1002 ENGINEERING PHYSICS 1B

Locations: Footscray Park.
Prerequisites:REP1001 - ENGINEERING PHYSICS 1A
Description: Thermodynamics: temperature, thermal expansion, heat conduction and insulation, heat capacity, specific and latent heat, ideal gases, work and heat in the thermal process, 1st law of thermodynamics, heat engines and the 2nd law of thermodynamics, thermal radiation. Quantum Physics Planck's hypothesis, photons and the photoelectric effect, photons and the Compton effect, pair production, wave – particle duality, wave nature of matter, Bohr model of the atom, Heisenberg uncertainty principle, quantum numbers. Solid State Physics: Bonding in molecules, bonding in solids, free electron model of metals, band theory in solids, semiconductors and doping, semiconductor diodes, transistors. Nuclear Physics: Properties of the nucleus, binding energy, radioactive decay, half-life, radioactive dating, fission and fusion (3 weeks)
Credit Points:12

Learning Outcomes: Upon successful completion of this unit students will be able:

- to identify the key elements in a previously unseen problem associated with the content area of this subjectto locate the relevant underpinning theory in references available to them
- to use that support and appropriate mathematical techniques to apply that information to the novel situation to reach a solution to the problem posed.

Class Contact:60 hours per semester comprising 48 hours of lectures/tutorial and 12 hours of laboratory
Required Reading: Giancoli, D.C. Physics for Scientists and Engineers with Modern Physics, 3rd Edition, 2000, Prentice Hall Engineering Physics 1B Laboratory Manual, Victoria University
Assessment: Class tests conducted throughout the semester, 20%;Laboratory performance (5 x 4% laboratories during the semester), 20%; End of semester examination 60%.

REP1003 ENGINEERING PHYSICS 1C

Locations: Footscray Park.
Prerequisites:REP1001 - ENGINEERING PHYSICS 1A
Description:A selection of topics taken from the following:Thermodynamics: temperature, thermal expansion, heat conduction and insulation, heat capacity, specific and latent heat, ideal gases, work and heat in the thermal process, 1st law of thermodynamics, heat engines and the 2nd law of thermodynamics, thermal radiation.Electrical Devices: Fundamentals of electric circuits, series and parallel circuits, circuit analysis, DC and AC circuits, operation, performance characteristics and selection of motors and generators
Credit Points:12
Required Reading: Giancoli, D.C. Physics for Scientists and Engineers with Modern Physics, 3rd Edition, 2000, Prentice HallEngineeringPhysics !A Laboratory Manual Victoria University
Assessment: Class tests conducted throughout the semester (5 x 4% tests), 20%;

Laboratory performance (5 x 4% laboratories during the semester), 20%; End of semester examination 60%.

REP4100 DATA ACQUISITION

Locations: Footscray Park.

Prerequisites:VEF1002 - ENABLING SCIENCES 1BOR ENF1202 Engineering Physics 2

Description: Experimental data handling: measurements and errors. Types of errors, combining errors. Graphical analysis, statistical distributions.Sensors and transducers: Transducer types, e.g. resistive, voltage, current, capacitive, inductive. Transducer circuits such as bridges and operational amplifiers. Generalised measurement systems.Computer laboratory interfacing: Analogue to digital conversion: Data acquisition, time varying signals and the sampling theorem. Digital to analogue conversion: Generation of DC and AC voltages. Adaptive computer control: Digital input and output. General Purpose Interface Bus (GPIB); description and overview.Graphical programming: Fundamentals of a graphical programming environment for the creation of a 'virtual instrument', e.g. LabVIEW.Project: Students will be assigned projects that will involve the automation of an experiment, both in terms of the hardware and software requirements.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to have a sound grasp of experimental measurement and error handling techniques; to be able to use a variety of transducers in appropriate circuits for measurement of physical parameters; to be able to automate a simple experiment using a graphical programming environment.

Class Contact:48 hours per semester of lecture/tutorial/laboratory sessions.

Required Reading: Kirkup, L, 1994, Experimental Methods, John Wiley & Sons, Qld; ; Bishop, R. H., 2004, Learning with LabVIEW 7 Express, Pearson Prentice Hall, Upper Saddle River, NJ

Assessment: Assignments 20% ; End of semester examination 40%; Project and laboratory reports 40%.

REP4200 DIRECTED STUDIES IN PHYSICS 2

Locations: Footscray Park.

Prerequisites:VEF1002 - ENABLING SCIENCES 1BOR ENF1202 Engineering Physics 2

Description:A selection of topics from the following:Classical Mechanics; Thermodynamics*; Electromagnetism *; Optics*; Quantum Mechanics*; Nuclear Physics*; Relativity; High Energy Physics; Electrical and Electronic Machines.* Advanced studies which extend the material covered in first year subjects.

Credit Points:12

Class Contact:60 hours per semester of lecture/tutorial/seminar/laboratory sessions.

Required Reading: No text will be prescribed. Students will be expected to read widely around the topics in the subject.

Assessment:A series of regular group assignments and tests will be negotiated for each individual student or group of students with a similar background. The assessment regime will be equivalent to that for a second year physics subject in a technological degree in the content areas covered by this subject whilst recognising the differing backgrounds of the students undertaking the subject - especially in mathematics.

REP4300 EINSTEIN'S THEORY OF RELATIVITY

Locations: Footscray Park.

Prerequisites: Nil.

Description: Newtonian Relativity; Frame of Reference transformations; Einstein's relativistic postulates; Time dilation and length contraction; Relativistic velocity and mass; E=mc2; Introduction to General Relativity.

Credit Points:6

Class Contact:24 hours per semester of lecture/tutorial/seminar sessions.

Required Reading: No text will be prescribed. Students will be expected to read widely around the topics in the subject.

Assessment:60 % assignments submitted throughout the semester - approximate length of no more than eight A4 pages each; 40 % classroom presentation chosen from a range of topics provided by the lecturer in charge.

RMA1001 ENGINEERING MATHEMATICS 1A

Locations: Werribee, Footscray Park.

Prerequisites: Nil.

Description: Basic algebra, including index, log laws, indicial and log equations, algebraic expansions; Functions, straight line, parabola, circle etc. Mod function. Domain, range, inverse functions; Trig. Functions and their graphs, period amplitude, degrees radians. Basic trig identities, Inverse Trig functions. Converting aCosx+-bSinx to single Sin, Cosine terms; Limits, continuity, differentiation, rules, higher derivatives, Implicit differentiation. Tangents and Normals; Parametric differentiation, derivatives of logs and exponentials. Rates of change, maximum and minimum problems. Trig and inverse trig derivatives, logarithmic differentiation; Introduction to integration. Fundamental theorem of Integral Calculus. Substitution rule. Areas, Mean values, Root mean square; Methods of integration, partial fractions, simple integration by parts; Introduction to differential equations, separation of variables, population growth, air resistance; Complex numbers; Vectors.

Credit Points:12

Class Contact:60 hours of lectures/tutorials per semester.

Required Reading:D.Hughes-Hallett, A.Gleason, W.McCallum et al. Single and Multivariate calculus. John Wiley and Sons, Inc. New York, 2005.

Assessment: There will be class tests, worth 30%, and an end of semester examination worth 70%. No word length limit applies.

RMA1002 ENGINEERING MATHEMATICS 1B

Locations: Footscray Park.

Prerequisites:RMA1001 - ENGINEERING MATHEMATICS 1A

Description: Descriptive statistics, data, histograms etc. Describing data, mean, median, mode, quantiles, measures of dispersion.Introduction to probability, sample space, mutually exclusive and independent events. Intro to PDF's and intro to Normal distribution.Normal distribution, mean of n variate values, 3,2,1 sigma confidence limits. Binomial, Poisson distributions.Exponential, Hypergeometric distr. Normal approx. to Binomial and Poisson. Sample mean. Central limit theorem.Determinants, matrices, Cramer's rule, inversion.Solution of systems of algebraic equations. Row operation, Gaussian elimination, echelon form, ranks.Newton Raphson, numerical integration. Midpoint, Trapezoidal and Simpsons rules.Introduction to series and some convergence tests.Simple power series and the Maclaurin series.Partial differentiation, algebraic, trig, exp, and log functions. Rules.Partial differentiation, conditions for max/min. Simple problems.Intro to second order constant coefficient, homogeneous D.E's. Three types of solutions via the auxiliary equation.

Credit Points:12

Class Contact:60 hours of lectures/tutorials per semester.

Required Reading:D.Hughes-Hallett, A.Gleason, W.McCallum et al. Single and Multivariate calculus, John Wiley and Sons, Inc. New York, 2005.

Assessment: There will be class tests, worth 30% and an end of semester examination worth 70%. No word length limit applies

RMA1010 INTRODUCTORY MATHEMATICS

Locations: Footscray Park.

Prerequisites: Nil.

Description: Semester one: Algebra and Graph Sketching: Polynomials and other algebraic functions, expansion and factorisation. Factor theorem and algebraic division. Equation solving-linear quadratic and general polynomial. Simultaneous equations. Factorial and sigma notation. Binomial theorem for positive integer indices. Graph sketching-general polynomial functions, straight lines, parabolae, circles, ellipses, hyperbolae, rational functions. Indices, Logarithms and Trigonometry: Indices and logarithms. Exponential and logarithmic functions. Exponential growth and decay. Revision of basic Trigonometry. Trigonometric functions and identities. Graphs of simple trigonometric functions. Solution of simple trigonometric equations. Semester two: Introductory Calculus: Co-ordinate geometry of the straight line. Limits and continuity. Differentiation from first principles. Derivatives of algebraic, logarithmic exponential and trigonometric functions. Product quotient and chain rules. Applications of differentiation: tangents and normals, maxima and minima, rates of change, etc. Basic rules of integration: algebraic, trigonometric and exponential functions. Integration as a process of summation. Applications. Statistics and Probability: Introductory probability including independent, mutually exclusive events, conditional probability. Data analysis. Discrete and continuous probability distributions. Special discrete and continuous probability distributions, e.g. binomial, Poisson, geometric, normal distributions.

Credit Points:12

Class Contact: Four hours per week for two semesters based on two hour lectures and two hour tutorial sessions.

Required Reading: To be advised by lecturer.

Assessment: Tests and assignments, 40%; one three-hour examination at the end of each semester, 60%. A satisfactory level of assessment for each component is required for a subject pass..

RMA1110 MATHEMATICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 1

Locations: Werribee, St. Albans.

Prerequisites: Nil.

Description: Revision of basic algebra and logarithms. Discussion of units, accuracy, precision and significant figures in experimental work. An introduction to matrices and matrix manipulation. Functions and graphs. Solutions of polynomial equations and the general concept of an equation and its solution. Introduction to the methods and applications of differential calculus - local and global max/min. Fitting functions to points and the method of least squares.

Credit Points:12

Class Contact: Four hours per week for one semester consisting of one, one hour lecture and three hours of practice classes.

Required Reading: Bittinger, M.L., Calculus and Its Applications, 7th Edition, Addison Wesley.

Assessment: Test 1 (week 3), 15%; Test 2 (week 10), 25%; Final Examination, 60%.

RMA1120 STATISTICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 2

Locations: Werribee, St. Albans.

Prerequisites: Nil.

Description: Representing data graphically and standard summary statistics. Elementary notions of probability and random variable (discrete and continuous). The binomial and normal variables. Point and interval estimation and testing hypotheses on proportions, means and variances.

Credit Points:12

Class Contact: Four hours per week for one semester consisting of one, one hour lecture, one, two hour tutorial and one, one hour computer laboratory.

Required Reading: Samuels, M.L., Witmer, J.A., Statistics for the Life Sciences, 3rd Edition, Prentice Hall

Assessment: Tutorial test (15%), computer test/assignment (15%) examination (70%).

RMA2120 MATHEMATICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 2

Locations: Werribee.

Prerequisites:RMA1110 - MATHEMATICS FOR THE BIOLOGICAL AND CHEMICAL SCIENCES 1

Description: Review of trigonometric functions. Basic integration. Ordinary differential equations. Multiple integrals. Partial derivatives and the heat and wave equations. Matrices. Series expansions of functions - Taylor and Fourier series.

Credit Points:12

Class Contact: Four hours per week for one semester consisting of 1 hr lecture, 2 hrs tutorial and 1 hr tutorial/computer lab.

Required Reading: To be advised.

Assessment: Tutorial test (15%,) Computer test (15%), Examination (70%)

RMA3071 INTRODUCTION TO COMPUTER UTILISATION

Locations: Werribee.

Prerequisites: Nil.

Description: Web design, Hypertext Mark-up Language (HTML), C Program, Microsoft Excel.

Credit Points:6

Class Contact: Three hours per week for one semester, comprising one-hour lectures and two one-hour tutorial/lab.

Required Reading: To be advised.

Assessment: Final examination: 70%; Assignment/test: 30%.

RMA4001 ADVANCED MATHEMATICS FOR ELECTRICAL ENGINEERS

Locations: Footscray Park.

Prerequisites:VEF2002 - SYSTEMS AND MATHEMATICS 2B

Description:A range of topics are to be selected from the following areas: (1) Numerical linear algebra, (2) Constraint and unconstraint optimization problems, (3) Iterative solutions of nonlinear algebraic equations and ordinary differential equations, (4) Mean square theory of random processes.

Credit Points:12

Class Contact:60 hours of lecture/tutorial per semester.

Required Reading: Advanced Mathematics for Electrical Engineers Subject Notes, Victoria University.Mathematical Methods for Scientists and Engineers. D.A.McQuarrie. University Science Books, 2003.

Assessment: Mid-semester test 40% Examination 60%.

RMS3010 BIOPROCESSING APPLICATIONS

Locations: Werribee.

Prerequisites: Nil.

Description: Topics include enzyme production and applications, algal biotechnology, bioremediation, bioleaching of metals from low grade ore, commercial and domestic wastewater treatment, biomass conversion and microbial fuel production. The ethical issues associated with these topics will be discussed.

Credit Points:12

Class Contact:5 hours per week comprising three hours of lectures and two hours of laboratory work.

Required Reading: Mitchell, R. 1993. Environmental Microbiology, Wiley-Liss Inc.; Shuler, M.L. and Kargi, F., 2002. Bioprocess Engineering: Basic Concepts, 2nd edn, Prentice-Hall Inc.
Assessment: Assignment (1 x 2000 words), 20%; Laboratory Reports (4 x reports), 30%; Exam (1 x three hrs), 50%.

RMS3020 GENOMICS, PROTEOMICS AND BIOINFORMATICS

Locations: Werribee.
Prerequisites:RBF2520 Biochemistry 1.
Description: An overview and definitions of terms; the logic, scope and rationale of genomics and proteomics; descriptions of approaches used in genomics and proteomics; applications of bioinformatics including accessing internet resources such as GenBank and EMBL, data mining, and using programs such as BLAST and FASTA; examples of applications in a range of settings including forensics, drug design, medical research. The theory underpinning a range of analytical techniques used in nucleic acid and protein analysis will also be covered. Ethical issues concerning the ownership of and access to information in databanks will be covered.
Credit Points:12
Class Contact:5 hours per week comprising three hours of lectures and two hours of laboratory work.
Required Reading: Primrose, S.B. & Twyman, R.M. (2003) Principles of Genome Analysis and Genomics. Blackwell Science Publishing; Campbell, A.M. & Heyer, L.J. (2003) Discovering Genomics, Proteomics & Bioinformatics, CSHL Press, Benjamin-Cummings. San Francisco, CA, USA; Switzer, R. L. & Garrity, L.F. (2000) Experimental Biochemistry. W.H. Freeman & Co., New York, USA.
Assessment: Assignment (1 x 3000 words), 20%; Laboratory Reports (10 x reports), 30%; Exam (1 x three hrs), 50%.

RMS3030 GENETIC ENGINEERING

Locations: Werribee, St Albans.
Prerequisites:RBF2520 Biochemistry 1; RBF2390 Molecular Genetics.
Description: The unit will include gene cloning, PCR, restriction enzymes and their uses; site-directed mutagenesis; heterologous gene expression systems; DNA profiling and forensics; Southern and Northern Blotting; gene mapping; transgenics and gene knockouts; the Human Genome Project and gene therapy; recombinant DNA-based medical diagnostics; positional cloning; plant genetic engineering; and the ethics, risks and benefits of genetic engineering.
Credit Points:12
Class Contact:5 hours per week comprising three hours of lectures and two hours of laboratory work.
Required Reading: Glick, B.R. & Pasternak, J.J. (2003) Molecular Biotechnology: Principles and Applications of Recombinant DNA, 3rd Edition. American Society for Microbiology; Miesfeld, R.L.(1999) Applied Molecular Genetics. Wiley-Liss Publications.
Assessment: Assignment 20%; Laboratory Reports (4 x reports), 25%; Exam (1 x three hrs), 55%.

RMS3045 PROJECT 2 - BIOTECHNOLOGY

Locations: Werribee.
Prerequisites:RMS3040 - PROJECT 1 - BIOTECHNOLOGY
Description: This unit covers project methodology, experimental and analytical design, research plan preparation, analysis of results and thesis writing. A project will normally have been selected by the student in consultation with academic staff in the prerequisite subject, Project 1-Biotechnology.
Credit Points:12
Class Contact:6 hours per week comprising laboratory work and workshops.
Required Reading: Third Year Project Study Guide, 2006, Victoria University; Students will be required to review from the current literature a selection of papers related to their chosen topic.
Assessment:6 hours per week comprising laboratory work and workshops.

RMS3050 ADVANCED MEDICAL MICROBIOLOGY

Locations: Werribee.
Prerequisites:RBF2310 Microbiology 2 or equivalent.
Description: The unit will focus on the molecular aspects of microbial pathogenesis and highlight the principal intervention strategies used to treat infectious diseases. The emphasis will be on the relationship between a pathogen (bacteria, viruses and protozoans) and its human host. An in depth review of the life cycles of several organisms will inform discussion of the current research in the areas of pathogenesis, genetic and phenotypic variation in pathogens and the implications for treatment and control strategies. Consideration will be given to the ethical issues relating to eg vaccination protocols and antimicrobial therapy.
Credit Points:6
Class Contact: Three hours per week comprising lectures and tutorials.
Required Reading: To be advised by the lecturer.
Assessment: Assignment (1 x 3000 words), 40%; Exam (1 x three hrs), 60%.

RMS3060 MICROBIAL TECHNOLOGY AND CELL CULTURE

Locations: Werribee.
Prerequisites:RBF2300 Microbiology 1 or equivalent.
Description: Topics include batch, fed-batch and continuous culture, bioreactors and their various modes of operation, plant cell culture and animal cell culture. Topical issues related to the ethics associated with the source and use of various cell lines eg. stem cells, will be discussed.
Credit Points:6
Class Contact:three hours per week, comprising lectures and practical work in alternating weeks.
Required Reading: Sharp, J. Crowley, B.R. and Kwok, K.H. 1995. Plant Cell Culture, TAFE Productions; Jenkins, N. 1999. Animal Cell Culture; Methods and Protocols, Humana Press Inc.
Assessment: Laboratory Reports (3 x reports), 40%; Exam (1 x two hrs), 60%.

RMS3113 COMPARATIVE IMMUNOBIOLOGY

Locations: Werribee.
Prerequisites:RBF2300 - MICROBIOLOGY 1RBF2330 - CELL BIOLOGY
Description: This unit of study examines strategies of disease resistance and internal defence in prokaryotes and eukaryotes and their importance in the field of biotechnology. The specific aims of this unit of study are: to develop an understanding of the nature of immunity and resistance; to develop an understanding of the mechanisms underlying internal defence in organisms; to develop an understanding of the evolution of defence mechanisms in prokaryotes and eukaryotes. Topics covered include: the molecular and cellular components of the vertebrate immune system; innate and adaptive responses to pathogens; the evolution of metazoan immunity; the restriction modification system and other defence mechanisms of prokaryotes; hypersensitive response and systemic acquired resistance in plants; immunology-related advances in biotechnology.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- describe the adaptive and innate immune response to pathogens in vertebrates;
- compare and contrast strategies of defence against pathogens in prokaryotes and eukaryotes;
- recall key evolutionary events leading to the development of the immune response;
- perform several immunology-based laboratory techniques including the ELISA assay, Western Blot and Immunodiffusion assay;
- apply this knowledge in areas of biotechnology.

Class Contact:72 hours per semester, comprising lectures, laboratory classes and tutorials.
Required Reading: Janeway, CA, Travers, P, Walport, M, Shlomchik, MJ. (2004) Immunobiology: the immune system in health and disease. Blackwell. Workbook of scientific papers and articles
Assessment: Examination, Written examination (50%) Students are required to pass a written examination of 3 hours duration. Main core graduate attributes: P3, W3, A3, 50%. Practicum, Practical classes (30%) Students will attend 8 practical classes and submit laboratory reports. Practical classes will require students to work co-ope, 30%. Assignment, Assignment (20%) Students will submit a written assignment on a topic related to the unit of study. Students will be required to locate, evaluate and, 20%.

RMS5100 ENVIRONMENTAL IMPACT ASSESSMENT FOR ECOLOGISTS

Locations: Werribee.
Prerequisites: Nil.
Description: This unit introduces environmental impact assessment and its importance in ecologically sustainable development. Its specific aim is to develop the knowledge and skills required to design and undertake an EIA. The unit begins with an overview of the principles and practices of EIA, especially those involving ecological studies, and a survey of the relevant Commonwealth and state legislation. Topics covered include the elements of the EIA process; communication with stakeholders; protocols for baseline studies; impact predictions under differing scenarios; impact mitigation; the importance of continued monitoring; and an introduction to the emerging field of strategic environmental assessment (SEA).
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- identify key issues in environmental impact assessment
- locate and interpret relevant legislation
- use databases to gather relevant ecological information
- develop a plan for conducting the ecological component of an EIA on a nominated area
- locate, appraise and synthesise relevant literature
- prepare a report in an appropriate style
- communicate with a range of stakeholders.

Class Contact:36 hours for one semester comprising 24 hours of lectures and 12 hours of workshops.
Required Reading: Harvey, N. (1998) Environmental Impact Assessment Procedures, Practice and Prospects in Australia. Oxford University Press. School of Molecular Sciences. (2007) Conservation Legislation in Australia. Victoria University.
Assessment: Written assignment 1 (30%) 2,000 2,500 words. Written assignment 2 (30%) 2,000 2,500 words. Written report (40%) 3,500 4,000 words. Students must attain a minimum mark of 50% in each assessable component to pass this unit of study.

RMS5101 ENVIRONMENTAL MANAGEMENT AS A PROFESSION

Locations: Werribee.
Prerequisites: Nil.
Description: This unit introduces students to the professional practice of environmental management. Its specific aim is to develop an understanding of the role of the environmental manager in industry and the wider community. It covers ethics and responsibilities; types of employment for environmental managers; outsourcing and specialization; managing uncertainty and risks; interpreting consultancy briefs; tendering for consultancy opportunities; and preparing reports for varying audiences.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- demonstrate familiarity with the range of employment opportunities for environmental managers
- prepare a brief for an EIA
- prepare a tender document
- prepare a report for a target audience

Class Contact:36 hours for one semester comprising 27 hours of lectures and 9 hours of workshops
Required Reading: School of Molecular Sciences. (2008) RMS5101 Class Notes. Victoria University.
Assessment: Written assignment (25%) 2,000 2,500 words. Written assignment (25%) 2,000 2,500 words. Written report (50%) 4,500 5,000 words. Students must attain a minimum mark of 50% in each assessable component to pass this unit of study.

RMS5140 BIOPROCESSING TECHNOLOGY PRINCIPLES

Locations: Werribee.
Prerequisites: Nil.
Description: Principles of biochemical engineering, material and energy balance, fermentation technologies, bioreactor design and applications, harvesting and purification of bioproducts, filtration systems and commercial-scale applications of biological-based systems.
Credit Points:12
Class Contact: Three hours per week of lectures/tutorials.
Required Reading: Shuler, M.L. & Kargi, F., 2002, Bioprocess Engineering: Basic Concepts, 2nd edn, Prentice-Hall.
Assessment: One assignments (3000 words, 30%); examination (3h, 70%).

RMS5145 BIOPROCESSING TECHNOLOGY APPLICATIONS

Locations: Werribee.
Prerequisites: Nil.
Description: Laboratory-scale experiments will be conducted that train students in the areas of downstream processing, plant and algal products, heat-exchange, fermentation, fluid flow, enzyme engineering, biomass conversion and sustainable energy systems.
Credit Points:12

Class Contact: three hours/week of laboratory practicals.
Required Reading: Shuler, M.L. and Kargi, F., 2002, Bioprocess Engineering: Basic Concepts, 2nd edn, Prentice - Hall Inc.
Assessment: Laboratory reports (100%).

RMS5200 ENVIRONMENTAL MANAGEMENT IN A CHANGING WORLD

Locations: Werribee.
Prerequisites: Nil.
Description: This unit explores the potential impacts of climate change, including drought and sea level change, and of increasing population density in vulnerable areas. It specific aim is to develop the knowledge and skills required to manage the environment in the face of large scale changes. It covers natural and anthropogenic climate change; methods of assessing, monitoring and interpreting climate data; Australian and international agreements; changes in human geography; impacts on natural ecosystems; impacts on human populations; mitigation politics; and informed decision-making processes.
Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- identify the potential impacts of climate change on different locations
- recognise the major causes of anthropogenic climate change
- interpret basic climate data
- use computer programs to explore human geography
- identify the potential impacts of changing populations

Class Contact: 36 hours for one semester comprising 18 hours of lectures and 18 hours of workshops.
Required Reading: Intergovernmental Panel on Climate Change (2007). Report. Available from http://www.climatechangeinaustralia.gov.au/resources.php Steffen, W. et al. (2004) Global change and the Earth System. Springer-Verlag.
Assessment: Case studies (30%) Written exam (70%) Students must attain a minimum mark of 50% in each assessable component to pass this unit of study.

RMS6140 CELL CULTURE AND FERMENTATION TECHNOLOGY

Locations: Werribee.
Prerequisites: Nil.
Description: This unit will provide students with knowledge in the cultivation of microogranisms and higher eukaryotic cells at the small-scale laboratory and commercial scales. This includes plant culture, microbial fermentations and animal cell culture techniques. Topics will include batch, fed-batch and continuous cultures and bioreactors. The technology of stem cells will also be introduced and ethical issues regarding these will be discussed.
Credit Points: 12
Class Contact: three hours/week comprising lectures and practical work each alternate week.
Required Reading: Bryce, C.F.A., 1999, Fermentation Microbiology and Biotechnology, T&F STM.
Assessment: Three practical reports (40%); final examination (3h, 60%).

RMS6141 ANIMAL AND PLANT BIOTECHNOLOGY

Locations: Werribee.
Prerequisites: Molecular Genetics Theory.
Description: This unit will provide an in-depth understanding of how animal productivity and efficiency have been improved using technology such as embryo transfer, embryo splitting, in vitro fertilisation and cloning; principles of genetic engineering as applied to a wide range of plant species including wheat, canola oil and soy beans; use of transgenic technology to produce novel proteins and other biomolecules for the pharmaceutical industry.
Credit Points: 12
Class Contact: Class contact will be three hours per week for one semester.
Required Reading: Houdebine, L.M., 2003, Animal Transgenesis and Cloning, John Wiley & Sons.Slater, A., Scott, N.W. & Fowler, M.P., 2003, Plant Biotechnology: The Genetic Manipulation of Plants, Oxford University Press.
Assessment: One assignment (3000 words, 30%); one test (20%) and final examination (3h, 50%).

RMS6145 PROTEIN PRODUCTION, PURIFICATION & ANALYSIS

Locations: Werribee.
Prerequisites: Nil.
Description: Topics covered in the subject will include protein production in mammalian, bacterial, yeast and insect cell expression systems, protein purification and characterization using methods such as SDS-PAGE, purification using affinity and ion-exchange chromatography, protein crystallization, determination of protein structure, principles of X-ray crystallography and NMR in determining the structure of biological molecules including proteins.
Credit Points: 12
Class Contact: Three hours a week lectures, tutorials or practicals.
Required Reading: Switzer, R. L. & Garrity, L.F., 2000, Experimental Biochemistry, W.H. Freeman & Co., New York, USA.Wilson, K. & Walker, J. M., 2000, Principles and Techniques of Practical Biochemistry, Cambridge University Press, New York, USA.
Assessment: Practical reports (20%); one assignment (3000 words, 30%); final examination (3h, 50%).

RMS6200 PROJECT (BIOTECHNOLOGY)

Locations: Werribee, Industry.
Prerequisites: Successful completion of first year of the SMBT degree or equivalent with an average grade of Distinction (H2A) or higher, including Research Methodology (RCS5100) or equivalent. The offering of this project unit option is subject to availability of suitable projects and supervisors, as well as quality of academic performance of the student in the course to date
Description: Students will propose and conduct an independent, practical, hands-on biotechnology project either industry-based or internally offered. Students undertaking this option will be expected to apply the knowledge and skills gained from the coursework component of SMBT degree to the project. The project will be a scientific investigation of an approved topic, consisting of a comprehensive literature review, project proposal, conduct of laboratory or computer-based research, critical analysis and interpretation of results, clear and concise communication of these and discussion followed by a conclusion. The student will be expected to comply with all regulations concerning Occupational Health and Safety (OH&S) and Good Laboratory Practice (GLP).
Credit Points: 36

Learning Outcomes: Upon completion of this unit, it is expected that students will be able to:

- Find, select, read and critically analyse published literature on a particular topic

- Competently formulate a sound experimental proposal
- Independently plan and carry out investigative laboratory experiments
- Objectively and critically analyse, discuss and report results obtained.

Class Contact: This unit will replace four electives in the existing Masters course. There are no contact hours in this unit as it is a entirely project-based. A total of 432 hours input will be expected for the unit, consisting of literature searches, proposal writing, laboratory research work and report-writing for the unit. This unit is worth 48 credit points (25%) of the course.
Required Reading: Carey, S.S. (2003) A Beginners Guide to Scientific Method, 3rd Edition, Wadsworth Publishing; Ruxton, G.D. & Colegrave, N. (2006) Experimental Design for the Life Sciences, 2nd Edition, Oxford University Press.
Assessment:A report on all aspects of the project including literature review, aims of the proposal, experimental methods, results, critical evaluation of results and discussion, the length of which shall be in the range of 15,000 to 25,000 words (75%); appraisal and assessment from the supervisor of the oral & written communication and problem-solving skills of the student as well as the general conduct and performance in the project e.g. application, punctuality, compliance with OH&S regulations and adherence to GLP principles.

RMS6220 RESEARCH PROJECT (BIOTECHNOLOGY)2

Locations: Werribee.
Prerequisites:RCS5100 - RESEARCH METHODOLOGY
Description: Research Project 2 (Biotechnology) will run concurrently with Research Project 1 (Biotechnology) and will allow students with an interest in research to spend more time in consolidating their research skills. Students will develop hands-on laboratory skills and will be required to research the literature, undertake independent research, critically analyse the results and present these in a formal project report for the topic selected in Research Project 1 (Biotechnology). Students will be expected to comply with all regulations concerning Occupational Health and Safety and Good Laboratory Practice.

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- competently plan experiments with sound experimental design;
- independently carry out investigative laboratory experiments;
- critically and thoroughly analyse experimental results and discuss them in context with the published literature;
- write a clear and comprehensive report based on experimental findings.

Class Contact: The equivalent of 72 hours for one semester comprising lectures, workshops and practical work.
Required Reading: Texts and peer-reviewed literature related to the chosen topic.
Assessment: Report, Written, 100%.

RMS6300 PROJECT (BIOTECHNOLOGY) 2

Locations: Werribee.
Prerequisites:RMS5100 - ENVIRONMENTAL IMPACT ASSESSMENT FOR ECOLOGISTSRMS6200 - PROJECT (BIOTECHNOLOGY)Successful completion of the first year of the SMBT degree or equivalent, with an average grade of H2A (Distinction) or above. The offering of this unit is subject to availability of suitable projects and supervisors, as well as quality of academic performance of the student in the course to date.
Description: Students will either continue the project carried out in RMS6200 Project (Biotechnology) 1 or propose and conduct a new independent, practical, hands-on biotechnology project either industry-based or internally offered. Students undertaking this option will be expected to apply the knowledge and skills gained from the coursework component of SMBT degree as well as from Project (Biotechnology) 1. Students will be expected to carry out this project independently and in a highly professional manner, with soundly planned experiments, objective and critical analyses of results obtained and a comprehensive discussion on the findings. They will be expected to comply with all regulations concerning Occupational Health and Safety (OH&S) and adhere to Good Laboratory Practice(GLP).
Credit Points:48
Learning Outcomes: Upon completion of this unit, it is expected that students will be able to Competently plan experiments with sound experimental design Independently carry out investigative laboratory experiments Critically and thoroughly analyse experimental results and discuss them in context of published literature in the area Write a clear and comprehensive report based on experimental findings.
Class Contact: This is a 100% project unit with no class contact. However, 432 hours of project work including literature searches, planning, laboratory research and writing will be expected.
Required Reading: Ruxton, G.D. & Colegrave, N. (2006) Experimental Design for the Life Sciences, 2nd Edition, Oxford University Press.
Assessment:A comprehensive, professional-style report including literature review, aims, experimental design, materials & methods, results, discussion and conclusion, the length of which shall be in the range of 20 - 40,000 words (75%); appraisal and assessment from the supervisor about the performance of the student in the project e.g. independence of thought, planning and conduct of project, oral & written communication and problem-solving skills of the student as well as the general conduct and performance in the project e.g. application, punctuality, compliance with OH&S regulations and adherence to GLP principles.

ROP8001 CONCEPTUALISING AND CONTEXTUALISING RESEARCH

Locations: Footscray Park, City Flinders.
Prerequisites: Nil.
Description: This unit provides postgraduate researchers with the opportunity to conceptualise and contextualise their proposed research within appropriate disciplinary discourses and paradigms as they develop their candidature proposal. It will develop their capacity to recognise and contextualise research questions or hypotheses within those disciplinary frameworks, and provide them with the opportunity to explore theoretical frameworks and research methodologies and techniques in relation to their particular research area. Topics Include: disciplines and paradigms, engagement with the literature, epistemologies and the application of knowledge, and choosing theories and methods.
Credit Points:12

Learning Outcomes: On successful completion of this unit, to the level required for an initial research candidature proposal, students should be able to:

- formulate an original and significant research question or problem that their research will address
- demonstrate an understanding of the epistemological basis of their research discipline(s)
- identify and specify how they will apply key theories and methodologies that relate to their area of research
- locate their research project within existing knowledge as represented in the literature

- justify their choice of theories and research methods and techniques within their chosen disciplinary framework(s).

Class Contact: Weekly seminar x10 weeks Burst mode: 3 days or 2 days + 2 half days Online

Required Reading: Steve Fuller, 2005, Kuhn vs. Popper: The Struggle for the Soul of Science, Columbia Uni Press. Harry Collins and Robert Evans, 2009, Rethinking Expertise, Uni Chicago Press.

Assessment: Research Paper, Paper to outline location of the research problem/issue in relation to existing knowledge and research approaches in the discipline/field., 50%. Other, Abstract outlining proposed research project. 150 words., 10%. Presentation, 12 minute oral presentation on research problem., 20%. Other, Web postings - Thirteen webCT posts of own findings and drafts as well as comments on findings and drafts by others., 20%.

ROP8002 RESEARCH INTEGRITY AND ETHICS

Locations: Footscray Park, City Flinders.

Prerequisites: Nil.

Description: This unit of study provides postgraduate researchers with the opportunity to gain advanced level understandings of integrity and ethics in relation to the conduct of research in a range of disciplinary contexts. It will develop the postgraduate researchers' capacities to engage in current debates about research ethics and integrity, and to identify and develop positions on critical issues in research integrity and ethics in relation to their own research project area. Topics include research governance and community ethics, research conduct, authorship and intellectual property, research limits, consent and confidentiality, animal research and commercialising research.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students should be able to:

- demonstrate an advanced understanding of fundamental principles and current debates about ethics and integrity in research;
- demonstrate familiarity with relevant national codes and university policies that impact on research practice and appropriate conduct in various research environments;
- identify key areas of ethics and integrity that relate to thir own area of research practice;
- demonstrate ability to critically evaluate options and approaches to resolve issues in research integrity and ethics that may arise in their field of research; and
- argue to defend a position in relation to research ethics and integrity as it relates to their own area of research practice and design of their own research project.

Class Contact: Weekly seminar x 10 weeks Burst mode - 3 days or 2 days + 2 half days Online

Required Reading: Macrina, F.L. 2005, 3rd edn, Scientific integrity: Text and cases in responsible conduct of research, Washington D.C.: ASM Press. Oliver, P. 2010, The Student's Guide to Research Ethics, Maidenhead: McGraw-Hill International, UK. Universitas 21 Program in Global Research Ethics and Integrity - online course resources.

Assessment: Portfolio, Reflective portfolio on ethics and integrity in research. 1000-2000 words., 20%. Research Paper, Paper on research ethics and integrity in relation to proposed research area. 2000-3000 words., 60%. Presentation, Poster presentation on an ethical or integrity issue in own field, 20%.

RPH1111 ASTRONOMY

Locations: Footscray Park.

Prerequisites: Nil.

Description: History of astronomy, telescopes, our sun, solar system, comets, meteors, the night sky, stellar evolution and spectra, variable stars, distances of celestial objects, galaxies, some predictions of Einstein's theory of relativity, the possibility of intelligent life elsewhere in the universe and high power astronomy (pulsars, black holes and quasars).

Credit Points:12

Learning Outcomes: Knowledge of Astronomy:To gain a good overview of our current knowledge of the universe, including its formation and the subsequent evolution of stars and galaxies.Practical Astronomy:To be able to use an amateur telescope to view well known stellar objects.

Class Contact:48 hours per semester comprising 36 hours of lectures/tutorial and 12 hours of laboratory

Required Reading: Arny, T. T. 2000, "Explorations: an introduction to astronomy", 2nd ed. 2000 update, McGraw

Assessment: Practical sessions 20%Assignments 80%

RPH4411 PHYSICS 4 (HONOURS)

Locations: Footscray Park.

Prerequisites: Eligibility for entry to the Bachelor of Science (Honours) in Physics program.

Description: This unit consists of advanced coursework and a research thesis. Coursework: Compulsory core units of quantum mechanics, statistical mechanics and research methods, plus elective units from the following areas: optical waveguides and sensors, relativity, surface physics, ion beam techniques, optics of materials, laser physics, lasers and optoelectronics, fibre optics, solid state physics, diffraction from crystals, nuclear physics. Other electives may be approved, including those offered at other universities. All electives must be approved by the Course Co-ordinator. Research Thesis: A research project will be undertaken in one of the Physics research areas, under the supervision of a member of academic staff. Subject to approval, research may be undertaken at a laboratory outside the University.

Credit Points:48

Class Contact: Average of 20 hours per week for two semesters.

Required Reading: Messiah, A. 1961, Quantum Mechanics Vols 1 and 2, North Holland, Amsterdam. Kittel, C., Thermal Physics, John Wiley and Sons.

Assessment:is based on coursework, 50%; research thesis, 50%. The research project will consist of oral presentation and a thesis of approximately 5,000-10,000 words.

RPH4412 PHYSICS 4 (HONOURS)

Locations: Footscray Park.

Prerequisites: Nil.

Description: Coursework: Compulsory core units of quantum mechanics, statistical mechanics and research methods, plus elective units from the following areas: optical waveguides and sensors, relativity, surface physics, ion beam techniques, optics of materials, laser physics, lasers and optoelectronics, fibre optics, solid state physics, diffraction from crystals, nuclear physics. Other electives may be approved, including those offered at other universities. The Course Co-ordinator must approve all electives.Research Thesis: A research project will be undertaken in one of the Physics research areas, under the supervision of a member of academic staff. Subject to approval, research may be undertaken at a laboratory outside the University.

Credit Points:48

Learning Outcomes: Advanced coursework:To gain a deeper understanding of quantum mechanics and statistical mechanics, and in addition undertake further studies in areas of physics related to the thesis.Research thesis:To gain experience in the conduct of a research project.

Class Contact: Average of 20 hours per week for one semester

Required Reading: Messiah, A. 1961, Quantum Mechanics Vols 1 and 2, North Holland, Amsterdam. Kittel, C., Thermal Physics, John Wiley and Sons.

Assessment: The grade for RPH4411 shall be either "S" or "U". An "S" grade will be awarded for satisfactory progression in both the coursework and research thesis components, for which the overall result for 2 semesters will be provided under RPH4412.

RPH8001 RESEARCH THESIS 1 FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:48

RPH8002 RESEARCH THESIS 2 FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:48

RPH8011 RESEARCH THESIS 1 PART TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:24

RPH8012 RESEARCH THESIS 2 PART TIME

Prerequisites: Nil.

Credit Points:24

RSS3000 INDUSTRY PROJECT

Locations: Werribee, St Albans.

Prerequisites: Successful completion of Years 1 and 2 of SBSS BSc (Specialisation).

Description: Industry Project is designed to engage students in workplace learning via student projects conducted in association with industry or projects related to current industry practice. Industry Project provides students with opportunities to apply previous learning to a project designed to link practice and theory. Projects are designed to deepen students' knowledge of their professional practice in realistic contexts, to further develop their employability and generic skills and provide a significant contribution to graduate work and career readiness. Projects can involve work conducted at Victoria University or within industry or community or both. Projects can include reports, practical work, fieldwork, industry placements. This unit is completed with advice from an approved supervisor. Assessment is according to the project and is by negotiated agreement amongst the relevant and approved industry partners and may be external where appropriate.

Credit Points:12

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to: locate, manage and use scientific information efficiently and effectively; solve scientific problems effectively in a range of settings including industry and community; exhibit high levels of numeracy skills in a range of scientific settings; communicate effectively in spoken and written forms on a range of scientific and mathematical topics to professional and community groups; apply an evidence-based research approach to a chosen area of science; respond with social and cultural awareness within local and global environments; work autonomously and collaboratively as a professional in both industry and community settings; autonomously manage own learning to achieve career and learning goals.

Class Contact: Projects will involve work conducted at Victoria University or within industry, the community or both. Projects can range from reports or practical work to fieldwork or industry placements. Contact hours are dependant on the type of project undertaken and will be arranged by negotiation with the student's approved RSS3000 Industry Project unit supervisor(s).

Required Reading: Reading materials will be negotiated in consultation with the supervisor(s) and will be appropriate to the topic under investigation. Where appropriate students will be advised to consult with the Learning in the Workplace and Community Policy and the Learning in the Workplace and Community: Operational Guidelines.

Assessment: Assessment depends upon the project and components within the project. All assessment items will be decided prior to commencement of semester and in conjunction with the student's approved supervisor(s). Where applicable, assessment and its negotiation may involve the relevant industry or community partners. All students will be assessed according to: project and project components (80%), and at least one formal oral presentation (20%). Project, Assessable components determined following negotiation with the approved supervisor(s), 80%. Presentation, At least one formal oral presentation on the project., 20%.

RTE5523A DEVELOP CLIMATIC RISK MANAGEMENT STRATEGIES

Locations: Industry, City Flinders.

Prerequisites: Nil.

Description: This competency standard describes the work function associated with developing climate risk management strategies for an agricultural, horticultural or land management enterprise. It requires the ability to research climate and enterprise data, analyse and interpret climate and enterprise data, prepare risk management strategies, and integrate climate risk and opportunities for management strategies at a business management level. Developing climate risk management strategies requires knowledge of current forecasting techniques, impact of weather and climate phenomena on rainfall, plant growth and yields, livestock production, causes of general patterns of weather and climate over Australia, climate variability and climate change, and direct and indirect impacts of climate variability on land management and sustainability.

Required Reading: No required text

Assessment: Assessment may include: assignments; classwork; projects; case studies; presentations; demonstration and observation.

RTE5902A DEVELOP AND REVIEW A BUSINESS PLAN

Locations: Industry, City Flinders.

Prerequisites: Nil.

Description: This competency standard covers the process of developing and reviewing business for an agricultural, horticultural or land management business enterprise. It requires the application of knowledge and skills to determine the scope of the business plan, prepare a business plan, determine goals, trial systems, and document, monitor and review the business plan. Competency must also be demonstrated in communicating business plan objectives to relevant parties. The work in this standard will be carried out with limited or no supervision, within enterprise guidelines.

Required Reading: No required text

Assessment: Assessment may include: assignments; classwork; projects; case studies; presentations; demonstration and observation.

RTE5912A PLAN AND MONITOR PRODUCTION PROCESSES

Locations: Industry, City Flinders.

Prerequisites: Nil.

Description: This competency standard covers the process of planning for production, and then monitoring the implementation of that plan. It includes the need to act in an environmentally aware manner, while at the same time maximising the production capacity of the organisation. It requires the need to analyse and extract information from a broad range of sources, and to comply with a variety of legislative and regulatory requirements. Planning and monitoring production processes is likely to be undertaken alone or under broad guidance. Responsibility for the planning and management of the work of others may be involved. Planning and monitoring production processes requires extensive knowledge in some areas such as sustainable land use principles and practices, and a range of technical and other skills such as planning, and cost benefit analysis.

Required Reading: No required text

Assessment: Assessment may include: assignments; classwork; projects; case studies; presentations; demonstration and observation.

RTE5916A PREPARE AND MONITOR BUDGETS AND FINANCIAL REPORTS

Locations: Industry, City Flinders.

Prerequisites: Nil.

Description: This competency standard covers the process of preparing budgets and financial reports, and the implementation and monitoring of budgets in agricultural, horticultural or land management enterprise. Work is likely to be undertaken alone or under limited guidance in line with a broad plan, budget or strategy. Responsibility and defined accountability for the work of others may be involved. Competency involves the self-directed development of knowledge with substantial depth across a number of areas with a range of skills. Competencies are usually used independently and are substantially non-routine. Significant judgement is required in planning design, technical or supervisory functions related to products, services, operations or processes.

Required Reading: No required text

Assessment: Assessment may include: assignments; classwork; projects; case studies; presentations; demonstration and observation.

SED1101 COMMUNITY BASED GENERAL SCIENCE 1

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit provides students with a working knowledge of scientific concepts in biology, earth sciences, physics and chemistry and opportunities to communicate knowledge of those concepts to socially and culturally diverse audiences via projects. Topics will be selected from science and associated areas, including earth materials (plate tectonics, elements of the earth), the atmosphere (moisture, clouds, precipitation), projectile motion, trigonometry, and fireworks. Students will be involved in the consultation, design, production, implementation, dissemination and evaluation of their own projects in order to experience the complexities of different socially and culturally diverse communities and improve communication skills within those groups.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Work effectively in settings of social and cultural diversity;
- Explain, report on, build their knowledge upon and convey the major concepts outlined in each of the subject areas to both peer-based and socially and culturally diverse audiences;
- Apply the skills and knowledge acquired in this unit so as to best communicate science to socially and culturally diverse audiences;
- Critically examine how to best pass on science-based material to socially and culturally diverse audiences without sacrificing science content;
- Apply knowledge, skills and values which will allow them to reflect on the best ways to communicate effectively general science, to socially and culturally diverse audiences whilst themselves maintaining a more advanced understanding of the subject area;
- Develop projects and evaluate their impact and ability to pass on scientific content and inquiry to socially and culturally diverse audiences;
- Further develop fundamental laboratory skills that are associated with projects aimed and set within socially and culturally diverse settings;
- Further develop skills in collecting and appropriately recording data;
- Further develop learning strategies for the successful understanding, application and communicating of science-based content to socially and culturally diverse audiences;
- Further develop skills in scientific method and utilising them to best serve projects designed to serve culturally diverse audiences;
- Recognise the need for, locate and critically analyse scientific data gathered by the student and reported in literature in project areas that share similar aims;
- Further extend competency in literacy and numeracy;
- Recognise the need for, and locate and critically analyse ways of, conveying scientific content to a socially and culturally diverse audience;
- Critically assess the quality of past studies and experiences within the scope of the level of study;

- Recognise that an interplay between science content and the communication of science is dependant on a number of factors that include cultural and that these factors be noted, understood, absorbed and utilised to their best effect in the learning, communicating and educational process of the student;
- Utilise knowledge gained from individuals within a defined setting, practical component, theory and past studies to better understand science concepts and to solve problems associated with them and the communication of science content;
- Recognise possible limitations and working around them when deciding how to implement the communication of science and projects within settings that are socially and culturally diverse;
- Recognise that a range of written scientific formats aimed at various audiences are an essential requirement of a communicator of science;
- Best establish a process of learning how to learn and educational empowerment;
- Produce portfolios incorporating assignments and laboratory reports in a range of formats, all of which tie into settings that are both socially and culturally diverse;
- Communicate orally with peers and various other audiences through presentations, discussions and debates;
- Come to a realisation that the understanding of differing social and cultural settings and those who inhabit them and means of affecting them is a strength, empowering one s education, providing unique preparation for future educational and vocational outcomes.

Class Contact: Seventy-two (72) hours or equivalent for one semester comprising lectures, tutorials, workshops, practical classes and placements.
Required Reading: Athanasiou, N. (Comp.). (2009). Readings for SED1101. Melbourne, Australia: Victoria University. Krauskopt, K., & Beiser, A. (2007). The physical universe (12th ed.). McGraw-Hill Science/Engineering/Math.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Project, Portfolios and presentations , 50%. Examination, One written examination , 50%.

SED1202 COMMUNITY BASED GENERAL SCIENCE 2

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit develops student s abilities to work effectively both autonomously and collaboratively as a means to further develop knowledge, skills, literacy competency and attitudes in the understanding, interpretation, communication and promotion of science within the community. The unit provides students with a background in general science (taking in aspects of physics, chemistry, biology and earth sciences), and requires that students produce and implement community-based projects that integrate this science background. Science areas include chemiluminescence, polymers, electricity, magnetism, gases in the atmosphere, fermentation and combustion science. Students will develop a science troupe to produce and perform general and subject science demonstrations or shows and resource materials for the primary and secondary education sectors.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Individually and collaboratively, explain, report on, build upon knowledge and convey the major concepts outlined in each of the subject areas to both a peer-based and multifaceted community audiences;
- Utilise the strengths of collaborative and autonomous approaches in the development, implementation and evaluation of community-based science projects;
- Explore how collaborative and autonomous strengths can aid further collaborative and autonomous efforts;
- Develop processes that prevent future possible lapses in the collaborative process and utilise this understanding to enhance future autonomous and collaborative ventures;
- Develop processes that avoid problems previously associated with autonomous approaches in the development, implementation and evaluation of science-based community projects and ventures and to utilise this understanding in enhancing future autonomous and collaborative projects;
- Further extend competency in literacy and numeracy;
- Recognise the social and culturally diverse natures of collaborative science-based community projects and utilise the experiences gained in future collaborative and autonomous projects and undertakings.
- Critically examine how to best impart science-based material to a variety of audiences without necessarily sacrificing science content;
- Apply knowledge, skills and values that will allow students to reflect on the best ways to communicate science to a variety of audiences and simultaneously maintain and build upon the student s more advanced understanding of the subject matter;
- Further enhance laboratory skills and work effectively in collaborative laboratory work;
- Further enhance skills in collecting and appropriately recording data;
- Further develop learning strategies for the successful understanding, application and communicating of science-based content within collaborative and autonomous frameworks;
- Further enhance skills in preparing succinct laboratory reports in correct scientific styles and formats;
- Recognise the need for, and locate and critically analyse scientific data;
- Recognise the need for, and locate and critically analyse ways of conveying scientific content to an audience and to be able to critically assess the quality of past studies and experiences in the areas of science studied;
- Facilitate constructive interplay between science content and the communication of science as a means of more effectively dispersing science content and inspiring and affecting the students understanding of the science areas undertaken;
- Recognise that the various written scientific formats, such as reviews, case studies, original reports, reflective writing and writing for community-based audiences, are of variable scientific merit;
- Produce portfolios incorporating assignments and laboratory reports in a range of formats that are collaboratively and autonomously produced;
- Verbally communicate science with peers and community groups and individuals through presentations, discussions and debates.

Class Contact: Seventy-two (72) hours or equivalent for one semester comprising lectures, tutorials, workshops, practical classes and placements.
Required Reading: Athanasiou, N. (Comp.). (2009). Readings for SED1202. Melbourne, Australia: Victoria University. Krauskopt, K., & Beiser, A. (2007). The physical universe (12th ed.). McGraw-Hill Science/Engineering/Math.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Project, portfolios and presentations , 50%. Examination, One written examination, 50%.

SED2103 COMMUNITY BASED GENERAL SCIENCE 3

Locations: Footscray Park.
Prerequisites:SED1101 - COMMUNITY BASED GENERAL SCIENCE 1SED1202 - COMMUNITY BASED GENERAL SCIENCE 2Or equivalents to be determined by Unit coordinator.
Description: This unit develops the student s problem solving skills and literacy competency as applied to science content and science-based community initiatives and projects. Students will be provided with a background in science concepts (in aspects of physics, chemistry, biology and earth sciences), upon which students will produce resources, including multimedia, and implement community-based projects and professional development workshops for primary and secondary school educators. Topics in this unit will include bio-fuels, colligative properties, sound, hydroponics, cell cultures, anthocyanin pigments and applications of chromatography.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Decide upon a planned detailed response and an implementation of the response(s) in solving problems associated with science-based community projects;
- Decide upon response procedures and an implementation of responses in areas beyond the scope of the project where autonomous, collaborative, varying social and culturally diverse situations may apply;
- Alter and re-coordinate response procedures if required;
- Establish codes of conduct that are amenable to adoption by others to expedite the problem solving process;
- Mentor in the process of science-based problem solving;
- Establish and be well versed in the link between research and the problem-solving process and to make this link accessible and knowledgeable to others;
- Identify the limitations in the problem-solving process and work around them;
- Tie together parties in a collaborative response and allow for independent work to best meet the requirements of the problem and its solving;
- Develop a means of predicting and preventing future possible lapses in the problem-solving process;
- Critically examine how to best communicate science based material inbuilt into problem-based scenarios to a variety of audiences without diminishing science content;
- Apply knowledge, skills and values that allow reflection on the best ways to communicate problem solving science to a variety of audiences and simultaneously maintain and build upon a more advanced understanding of the subject matter;
- Utilise and communicate unit content in the science problem-based project and evaluate its success;
- Further enhance laboratory skills and its application to problem solving;
- Further enhance skills in collecting and appropriately recording data;
- Further develop learning strategies for the successful understanding, application and communicating of problem-based science;
- Further enhance skills when preparing a succinct laboratory report in scientific method format and detailing the problem solving process;
- Recognise the need for, locate and critically analyse scientific data;
- Recognise the need for, locate and critically analyse ways of conveying scientific content to an audience;
- Critically assess the quality of past studies and experiences in specified areas of science;
- Facilitate constructive interplay between science content and the communication of science as a means of more effectively dispersing science content and inspiring with science content and affecting the student s understanding of the science areas undertaken;
- Demonstrate further literacy and numeracy skills;
- Identify a range of written scientific formats, such as reviews, case studies, original reports, reflective writing and writing for a community-based audience and recognise that the writings may be of variable scientific merit;
- Produce portfolios incorporating assignments and laboratory reports in a range of formats that are collaboratively and autonomously produced and outline key areas in the problem solving approach;
- Communicate orally with peers and community groups and individuals through presentations, discussions and debates in the context of science content.

Class Contact: Seventy-two (72) hours or equivalent for one semester comprising lectures, tutorials, workshops, practical classes and problem-based projects.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Project, Portfolios and presentations , 50%. Examination, One written examination , 50%.

SED2204 COMMUNITY BASED GENERAL SCIENCE 4

Locations: Footscray Park.
Prerequisites:SED1101 - COMMUNITY BASED GENERAL SCIENCE 1SED1202 - COMMUNITY BASED GENERAL SCIENCE 2Or equivalents to be determined by Unit coordinator.
Description: This unit further develops literacy levels and abilities to locate, evaluate, and use scientific and science based information and research effectively in an effort to develop, run and evaluate a science-based community oriented project/program/initiative that benefits educationally both the student and the community. The unit focuses on providing students with a background in science concepts in physics, chemistry, biology and earth sciences, and in particular in saponification and detergents, alginates and chitins, holography, Archimedes s Principles, photography and other science based areas. Students are then required to produce and implement community-based projects that integrate the science background. Students will be required to develop and deliver a continuing science-based project within a secondary level setting in a science-based competition or a science-based club within an organisation.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Locate, evaluate, manage and utilise information pertinent to the planning, construction, running and evaluating of a science-based community-based project(s) or initiatives;
- Use information that provides for enquiry by the project s audience and participants;
- Establish ways and means that effectively insure that unit content is utilised in a way that will benefit the student, the audience and the project(s)/initiatives;
- Develop editing processes that take into account the needs of the audience;
- Develop, maintain and re-create ways of communicating science-based ideas to an audience that has vastly differing science backgrounds;
- Develop portfolios that simultaneously incorporate aspects of science communication, ensuring that information contained within, including reflective pieces, are significant resources to aid future projects for themselves and others;
- Predict the limitations and work around them when establishing project partnerships;
- Communicate science ideas and content visually and orally within a limited timeframe and critically examine the stated goals and impact of the communication;
- Work collaboratively with other professionals in establishing, running and evaluating the science based community project;
- Develop a values system that serves the community well in accessing science based knowledge;
- Further build upon a more advanced understanding of subject material;
- Continue to enhance laboratory skills.
- Continue to enhance skills in collecting and appropriately recording data;
- Continue to develop learning strategies;
- Continue to enhance skills in researching and preparing succinct laboratory reports in scientific method format;
- Continue to enhance an understanding in science concepts;
- Further competency in literacy and numeracy;
- Mentor the critical analysis of scientific data;
- Recognise the need for, locate and critically analyse ways of conveying scientific content to an audience and to be able to critically assess the quality of past studies and experiences in specific science areas;
- Facilitate constructive interplay between science content and the communication of science as a means of more effectively dispersing science and inspiring it into the community;
- Identify a range of written scientific formats, such as reviews, case studies, original reports, reflective writing and writing for a community-based audience and recognise that the writings may be of variable scientific merit;
- Be engaging in the approach to science content and with the community in the transference of the material.

Class Contact: Seventy-two (72) hours or equivalent for one semester comprising lectures, tutorials, workshops, practical classes and problem-based projects.
Required Reading: Athanasiou, N. (Comp.). (2009). Readings for SED2204. Melbourne, Australia: Victoria University.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Project, Portfolios and presentations , 50%. Examination, One written examination , 50%.

SED3105 COMMUNITY BASED GENERAL SCIENCE 5

Locations: Footscray Park.
Prerequisites:SED2103 - COMMUNITY BASED GENERAL SCIENCE 3SED2204 - COMMUNITY BASED GENERAL SCIENCE 4Either/ or; or equivalent to be determined by Unit coordinator.
Description: This unit continues the development of the student s science content and develops in students, the professional communications role through the use of science-based projects within the community. Students learn to effectively communicate as a science scholar and citizen by improving their background in science concepts in physics, chemistry, biology and earth sciences, in particular in principles of archaeology, waterway analysis, fuel cells, solar energy, wine production and analysis, phytoremediation/salinity and nitrogen fixation. Students will be required to develop and deliver a continuing science-based project within a primary or secondary level setting, where their role will be as a visiting scientist-in-training.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Complete science based community projects that professionally communicate ideas, results and future directions, whilst simultaneously preserving the role of a citizen;
- Undertake and supply a detailed proposal, investigation and evaluation of the project, highlighting areas where further investigations and reasons for this so that both the community and professional bodies can harness the information provided;
- Establish protocols of management and communication that will aid their further education and their professional life, simultaneously affecting the community;
- Utilise past literacy practices to improve the process of locating, evaluating, managing and utilise information pertinent in the planning, construction, running and evaluating of a science based community based project(s) or initiative(s);
- Undertake considerable research with the aims of utilising information that will provide for enquiry in the project s audience and participants;
- Establish ways and means that effectively ensure that unit content is utilised in a way that will benefit the student, the audience and the project(s)/initiative and will best serve to emphasise the importance of the role of a citizen;
- Further enhance the communicative process;
- Develop portfolios that simultaneously incorporate aspects of science communication, ensuring that information contained within, including reflective pieces, are significant resources to aid future projects for themselves and others;
- Identify the limitations and seek ways and means of working around these limitations, so as to strengthen their resolve and their capacity as professionals and as citizens;

- Communicate science ideas, management strategies, and identify possible problems and resolutions to these problems via communication with other professional bodies;
- Work collaboratively with other professionals in establishing, running and evaluating science-based community projects;
- Discuss a values system that serves the community well in accessing science-based knowledge;
- Further competency in literacy and numeracy;
- Further build upon more advanced understanding of subject material and content;
- Continue to enhance laboratory skills;
- Continue to enhance skills in collecting and appropriately recording data;
- Continue to develop learning strategies and pass these one to other members of the community to further cement the notion of citizenship;
- Continue to enhance skills in researching and preparing succinct laboratory reports in scientific method format;
- Enhance skills in researching and preparing reports that are of a professional level maintaining the high level of scientific publication standard;
- Facilitate constructive interplay between science content and the communication of science as a means of more effectively dispersing science content and inspiring with science content and affecting the student s understanding of the science areas undertaken;
- Identify a range of written scientific formats, such as reviews, case studies, original reports, reflective writing and writing for a community-based audience and recognise that the writings may be of variable scientific merit;
- Extend the role of the citizen through science and science education.

Class Contact: Seventy-two (72) hours or equivalent for one semester comprising lectures, tutorials, workshops, practical classes and problem-based projects.
Required Reading: Athanasiou, N. (Comp.). (2009). Readings for SED3105. Melbourne, Australia: Victoria University
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Project, Portfolios and presentations , 50%. Examination, One written eximation, 50%.

SED3206 COMMUNITY BASED GENERAL SCIENCE 6

Locations: Footscray Park.
Prerequisites: At least two Community Based General Science units; or equivalents to be determined by Unit coordinator.
Description: This unit maintains and extends core attributes previously introduced and developed in the units Community Based General Science 1-5 and culminates in a significant science-based community project developed over the semester. The unit provides students with a background in science concepts (taking in aspects of physics, chemistry, biology and earth sciences), so that students can develop, implement and evaluate community-based projects that integrate this background. Students will be required to establish, promote, expand and maintain a science fair at a junior secondary level, and mentor and assist students in the design and production of group or individual science projects to be showcased at an end-of-year science fair. Students will continue to promote science to the wider community.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify their role as scientists and science communicators within the community;
- Establish protocols and communication traits that foster and facilitate effective and professional transfer of science information in various forms and formats and through contacts, the articulation of science concepts, research skills, writing skills for specific audiences, intuitive learning practices and problem solving skills;
- Discuss the importance of their role in the community and identify their professional role and commitment to the community as a citizen and communicator of facts, ideas and ideals generally but not exclusively from the discipline of science;
- Project-manage community science-based educational initiatives.

Class Contact: Seventy-two (72) hours or equivalent for one semester comprising lectures, tutorials, workshops, practical classes and problem-based projects.
Required Reading: Athanasiou, N. (Comp.). (2009). Readings for SED3206. Melbourne, Australia: Victoria University.
Assessment: In order to obtain a pass or higher in this graded unit, normally all components of assessment must be passed. Project, Community-based science project: portfolio and presentation (peer assessment: 50% external assessment: 50%), 100%.

SIRXSLS002A ADVISE ON PRODUCTS AND SERVICES

Locations: Footscray Nicholson, City King St.
Prerequisites: Nil.
Description: It describes the performance outcomes, skills and knowledge required to apply a depth of specialist or general product knowledge and a need for experience and skill in offering advice to customers.
Required Reading: No required reading.
Assessment: Students will be assessed on how they develop, maintain and convey detailed and specialised product knowledge. This will be achieved through a verbal assessment task / presentation as well as a written assessment.

SITHCCC021B HANDLE AND SERVE CHEESE

Locations: Footscray Nicholson, Industry.
Prerequisites:SITXOHS002A - FOLLOW WORKPLACE HYGIENE PROCEDURES
Description: This unit describes the performance outcomes, skills and knowledge required to identify, handle and present cheese. Cheeses may include milk-based products from cows, sheep, goats or buffalo, or alternatives such as soy. They may be traditional, contemporary or specialist and may be locally produced or imported. No licensing, legislative, regulatory or certification requirements apply to this unit at the time of endorsement.
Required Reading: Dodgshun, G., Peters, M. (2006). Cookery for the hospitality industry. England: Cambridge Uni Press England: Cambridge Uni Press School of Hosp & Tourism. (2009). Cert III in Commercial Cookery Manual. Melbourne: Vic Uni
Assessment: Direct observation, sampling, test and portfolio

SITXENV002A IMPLEMENT AND MONITOR ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES

Locations: Industry, Footscray Park.
Prerequisites: Nil.
Description: This unit describes the performance outcomes, skills and knowledge

required to analyse environmentally sustainable work practices effectively. It requires the ability to analyse current work practices, seek information from key stakeholders and specialists, set improvement targets, implement improvements and monitor their effectiveness. The unit is the second of three hierarchical service industry units that describe varying levels of participation in work practices that contribute to environmental sustainability. It is equivalent to GCSSUS02A from the Generic Guideline units for Sustainability.

Required Reading:no required text

Assessment:- project or work activities that show candidate's ability to analyse environmentally sustainable work practices, set improvement targets, implement improvements and monitor their effectiveness - knowledge of external benchmarks and how these can be applied to the workplace to improve environmental sustainability - knowledge of how to access information on the current range of legislation, regulations and industry codes and ability to interpret the requirements clearly as they relate to the business operation - knowledge of general environmental impacts and issues associated with service industry operations, minimal impact techniques and procedures and their application within the workplace - project or work activities conducted over a commercially realistic period of time so that the analysis, implementation and monitoring aspects of this unit can be assessed.

TLIC4019A DRIVE TRAIN TO OPERATIONAL REQUIREMENTS

Locations: Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to drive a train to operational requirements in accordance with safeworking and regulatory requirements and workplace procedures. This includes applying train management techniques to manage the movement of a train and, as the driver of a motive power unit, to conduct all movements and related activities required to achieve operational requirements. It also includes responding effectively to external factors and emergencies, handing over a train to a relief crew and stabling it at the end of a journey.

Required Reading:VU Produced Workbooks

Assessment: This unit includes LiWC and will be assessed by demonstration and observation and/or portfolio of evidence.

TLIP5004A DEVELOP A TRANSPORT AND LOGISTICS BUSINESS PLAN

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to develop a business plan for an organisation or a discrete business unit in the transport and logistics industry in accordance with relevant regulatory requirements and workplace procedures. This includes conducting a situational and market analysis, analysing the organisational environment, developing appropriate strategies, and implementing and evaluating the resulting business plan.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

TLIP5008A MANAGE A TRANSPORT AND LOGISTICS BUSINESS UNIT

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to manage a transport and logistics business unit in accordance with relevant regulatory requirements and workplace procedures. This includes identifying the market for the business unit, setting transport and logistics business unit objectives, collecting information for business planning operations, establishing the resources required to achieve objectives, and managing business unit performance to achieve the required outcomes.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

TLIP5025A SET AND ACHIEVE BUDGET

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to set and achieve a workplace budget in accordance with relevant regulatory requirements and workplace procedures. This includes planning the budget requirements, monitoring the budget and taking appropriate corrective action, monitoring expenditure, and reviewing and appropriately modifying the budget if necessary.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

TLIP5035A MANAGE BUDGETS AND FINANCIAL PLANS

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to manage budgets and financial plans. It covers all of the significant aspects of financial management for operational managers who are not financial specialists. It emphasises the preparation of users of budgets/financial plans through communication and training and consistent surveillance over budget performance, with early intervention where required.

Required Reading:VU Produced Workbooks

Assessment: This unit includes LiWC and will be assessed by demonstration and observation and/or portfolio of evidence.

TLIR4003A NEGOTIATE A CONTRACT

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to contract transport and distribution services in accordance with relevant regulatory requirements and workplace procedures. This includes negotiating the contract with a contractor, finalising the contract negotiations, and completing all enterprise contract requirements.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

TLIR5005A MANAGE A CONTRACT

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to manage a contract. It includes confirming contract requirements; establishing a contract management system; and monitoring and evaluating the contract.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

TLIR5006A DEVELOP, IMPLEMENT AND REVIEW PURCHASING STRATEGIES

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to develop, implement and review an organisation's purchasing strategies. It includes determining, developing and implementing purchasing strategies, evaluating these and implementing improvements.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

TLIR5007A MANAGE INTERNATIONAL PURCHASING

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to manage international purchasing of specific goods within workplace policies and procedures and regulatory frameworks. Licensing, legislative, regulatory or certification requirements are applicable to this unit.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to meet the controlled parameters in accordance with each competency unit's learning outcomes in the unit of study.

TLIR5014A MANAGE SUPPLIERS

Locations: Footscray Nicholson, Werribee, Industry.

Prerequisites: Nil.

Description: This unit involves the skills and knowledge required to manage suppliers. It includes assessing suppliers and building a productive relationship with them; evaluating delivery of goods/services; negotiating arrangements and resolving disagreements with suppliers; and reviewing supplier performance.

Required Reading:VU Produced Workbooks

Assessment: This unit includes LiWC and will be assessed by demonstration and observation and/or portfolio of evidence.

UEENEED002B ASSEMBLE, SET UP AND TEST PERSONAL COMPUTERS

Locations: Melton, Sunshine.

Prerequisites: Nil.

Description: This unit covers assembly, setting up and testing personal computers as directed in computer service manuals. It encompasses safe working practices, checking computer components, assembling components to form a basic personal computer, installing and testing basic operating system, drivers and application software, following written and oral instruction and applying customer relations procedures.

Required Reading:- Online Resources

Assessment: Assessment methods will: **-** satisfy the endorsed Assessment Guidelines of the Electrotechnology Training Package **-** reinforce that Competency is performed with inherent safe working practices expected in the Industry to which this unit applies. **-** include that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit. Specific unit assessments are located in the learning and assessment plans within the School. This unit lends itself to LiWC via a project or simulation.

UEENEED003B EVALUATE AND MODIFY PROGRAMS WRITTEN IN OBJECT ORIENTED CODE

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers evaluating and modifying programs based on object-oriented code. It encompasses safe working practices, following written and oral instruction and procedures, applying knowledge of object-oriented code scripting and testing and documenting outcomes.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED004B USE ENGINEERING APPLICATIONS SOFTWARE

Locations: Footscray Nicholson, Melton, Sunshine.

Prerequisites: Nil.

Description: This unit covers the use of computer application relevant to engineering support work functions. It encompasses applying user preferences, using application menus and tools, entering and retrieve information, working with groups and transferring and printing files.

Required Reading:- Online resources

Assessment: Assessment methods will: **-** satisfy the endorsed Assessment Guidelines of the Electrotechnology Training Package **-** reinforce that Competency is performed with inherent safe working practices expected in the Industry to which this unit applies. **-** include that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEED007B DEVELOP, ENTER AND VERIFY PROGRAMS FOR PROGRAMMABLE LOGIC CONTROLLERS USING LADDER INSTRUCTION SET

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers development, installation and testing of programs for programmable logic controllers (PLC) for a system requiring extended control functions. It encompasses working safely, applying knowledge of control systems, control system development methods, ladder logic control functions, using ladder instruction set, following written instructions and documenting program development and testing activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; Written responses, short and extended answers; Oral test / technical interview; On job or workplace assessment; Practical / exercises; Practical projects; Assignments; Personal appraisal; Verbal assessment; Profiling.

UEENEED010B SET UP AND CREATE CONTENT FOR A WEB SERVER

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers installation, set up, implementation and provision of on-going support of web services. It encompasses working safely, installing and administering server software and databases, service side scripting, configuring access and security and documenting work activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED011B DEVELOP OBJECT ORIENTED CODE

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers developing, implementing and testing object oriented programming solutions using object orientated programming language. It encompasses following development brief, using appropriate development software, writing code that features classes, inheritance, arrays, and advanced library components and documenting development activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED012B SUPPORT COMPUTER HARDWARE AND SOFTWARE

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers upgrading and maintaining computers, computer devices and peripherals and installing, maintaining and configuring software. It encompasses safe working practices, installing and testing the upgrading components, locating faults in hardware components, replacing faulty subsystems, installing and testing the operating system and application software, testing functionality, rectifying malfunctions, following written and oral instruction and procedures and applying appropriate customer relations.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED013B INSTALL AND ADMINISTER UNIX BASED COMPUTERS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the installation and administration of UNIX based and networked computers. It encompasses safe working practices, performing basic UNIX, Linux or Mac OSX operating system installation, administration functions of logging in and out, setting up GUI applications, manipulating text files, creating and searching files and directories, changing permissions, using text editors, identifying and modifying initialization files, streamlining command, execution using shell features, using basic network commands and documenting all administration activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED014B DESIGN AND MANAGE ENTERPRISE NETWORKS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers designing, managing, monitoring and diagnosing enterprise servers. It encompasses safe working practices, designing and managing Domain Name Server (DNS), Email servers, Dynamic Host Configuration Protocol (DHCP), Remote access servers, Network Address Translation (N/AT), Directory services, Authentication Servers and documenting all designing and managing activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED015B ADMINISTER USER NETWORKS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the administration of network servers. It encompasses safe working practices, establishing and maintaining user and group permissions, network security and shared resource management, monitoring and optimising network systems performance and reliability, maintaining currency of the network and documenting all administration activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED016B DEVELOP NETWORK SERVICES

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers develop services for network clients for emails, Internet access, shared resources . It encompasses safe working practices, installing and configuring Domain Name Server (DNS), email servers, Dynamic Host Configuration Protocol (DHCP), remote access servers, Network Address Translation (N/AT), directory services, Authentication Servers and documenting development activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED017B INSTALL AND CONFIGURE INTERNETWORKING SYSTEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers the interconnection of networks. It encompasses safe working practice, basic installation and configuration of switches and routers and documenting installation and configuration activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED018B DESIGN AND IMPLEMENT INTERNETWORKING SYSTEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers the design, implementation and performance monitoring of internetworking systems. It encompasses safe working practice, evaluating customer requirements, applying sound design principles, using Wide Area Network (WAN) technologies, complying with regulation and standards, and documentation of design and performance monitoring.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED023B DESIGN AND IMPLEMENT INTERNETWORKING SYSTEMS ¿ WIRELESS LANS/WANS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers the design, implementation and performance monitoring of internet working systems. It encompasses safe working practice, evaluating customer requirements, applying sound design principles, complying with regulation and standards, incorporation and advanced wireless LANs technologies and documentation of design and performance monitoring.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED024B INTEGRATE MULTIPLE COMPUTER OPERATING SYSTEMS ON A CLIENT SERVER NETWORK

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers interconnecting computers to form a local area network (LAN). It encompasses applying different computer and network operating systems on a single LAN, using network standards and protocols, selecting network topology and physical media, disaster planning recovery, performance management and documentation of work activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED026B DESIGN A COMPUTER BASED CONTROL SYSTEM

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design of computer application for control processes. It encompasses apply knowledge of control devices, control systems, programmable logic controllers, supervisory control and data acquisition systems and control programming methods, developing alternative design schemes based on design brief, customer relations and documenting designs.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; Written responses, short and extended answers; Oral test / technical interview; On job or workplace assessment; Practical / exercises; Practical projects; Assignments; Personal appraisal; Verbal assessment; Profiling.

UEENEED027B DEVELOP STRUCTURED PROGRAMS TO CONTROL EXTERNAL DEVICES

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers programming of microprocessor/microcontroller devices to access external devices. The unit encompasses working safely, applying knowledge of control applications, and analogue and digital input/output signals, programming fundamentals, writing and testing program and documenting programming activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; Written responses, short and extended answers; Oral test / technical interview; On job or workplace assessment; Practical / exercises; Practical projects; Assignments; Personal appraisal; Verbal assessment; Profiling.

UEENEED028B DEVELOP AND TEST CODE FOR MICROCONTROLLER DEVICES

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers structured programming instructions for micro devices at a fundamental level. The unit encompasses working safely, applying knowledge device architecture and programming fundamentals, writing and testing specified instructions and documenting development activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; Written responses, short and extended answers; Oral test / technical interview; On job or workplace assessment; Practical / exercises; Practical projects; Assignments; Personal appraisal; Verbal assessment; Profiling.

UEENEED029B DEVELOP BASIC WEB PAGES FOR ENGINEERING APPLICATIONS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the development of web pages for engineering applications. It encompasses working safely,developing web pages using authoring tools, client-side scripting, fundamental server-side scripting and documenting development activities.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED043B INSTALL AND CONFIGURE OPERATING SYSTEMS AND SOFTWARE

Locations: Footscray Nicholson, Melton, Sunshine.

Prerequisites: Nil.

Description: This unit covers installing and configuring an operating system and software on a personal computer. It encompasses safe working practices, installing and testing the operating system and application software, testing functionality, rectifying operating anomalies, following written and oral instruction and procedures and applying appropriate customer relstions.

Required Reading:- Online resources

Assessment: Assessment methods will: - satisfy the endorsed Assessment Guidelines of the Electrotechnology Training Package - reinforce that Competency is performed with inherent safe working practices expected in the Industry to which this unit applies. - include that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit. Specific unit assessments are located in the learning and assessment plans within the School. This unit lends itself to LiWC via a project or simulation.

UEENEED044B COMMISSION COMPUTER SYSTEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers undertaking commissioning procedures of computer systems to comply with predetermined parameters and delivery to client. It encompasses safe working practices, system parameter testing, analysis and adjusting to assure optimum performance, following procedures, and documenting final operating parameters and settings.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED045B MODIFY-REDESIGN OF COMPUTER SYSTEM

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers the modification and redesign of computer systems to augment existing systems for clients. It encompasses safe working practices, system parameter reconfiguration, analysis to assure optimum performance, following procedures, and documenting final modifications and settings.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED046B SET UP AND CONFIGURE BASIC LOCAL AREA NETWORK

Locations: Footscray Nicholson, Melton, Sunshine.

Prerequisites: Nil.

Description: This unit covers setting up, configuring and maintaining operation of a basic local area network (LAN) of up to 20 connected devices. It encompasses safe working practices, installing network hardware, installing and configuring network software, establish user accounts, configure shared Internet connection and documenting set up parameters and LAN topology.

Required Reading: - Online resources

Assessment: Assessment methods will: - satisfy the endorsed Assessment Guidelines of the Electrotechnology Training Package - reinforce that Competency is performed with inherent safe working practices expected in the Industry to which this unit applies. - include that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit. Specific unit assessments are located in the learning and assessment plans within the School. This unit lends itself to LiWC via a project or simulation.

UEENEED048B PLAN COMPUTER SYSTEMS PROJECT

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers development and documentation of computer systems project proposals, milestones and completions. The unit encompasses, establishing budgets, critical path analysis, development of workflow strategies, documenting, presenting and negotiating budgets and timelines.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEED101A USE COMPUTER APPLICATIONS RELEVANT TO A WORKPLACE

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers the basic use of personal computers application relevant to a work function. It encompasses switching the computer on, applying user preferences, selecting basic applications, entering and retrieving information and printing files.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Use basic computer applications relevant to workplace A Correctly starting-up a computer. B Dealing with anomalies appropriately. C Following application instructions to input and output information. D Storing information appropriately. E Outputting information to a printer. F Forwarding information via email and/or web mail in a readable format. G Producing, storing and forwarding engineering related reports and/or results using at least three computer applications according to requirements H Shutting down a computer correctly I Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEED104A USE SOFTWARE FOR ENGINEERING APPLICATIONS

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers the use of computer application relevant to engineering support work functions. It encompasses applying user preferences, using application menus and tools, entering and retrieve information, working with groups and transferring and printing files.

Required Reading: VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Use engineering applications software including: A Following application instructions to input and output information. B Storing information appropriately. C Outputting information to a printer. D Transferring information between systems. E Saving, storing and backing up files for effective retrieval by others. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEED147A DEVELOP ENERGY SECTOR DIRECTORY SERVICES

Locations: Industry, Sunshine.

Prerequisites:UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers developing energy sector directory services to support centralised management and security, centralised authentication, information security and single sign on for network users, and standardised access to application data. It encompasses safe working practices, configuring directory integrated Domain Name System (DNS), installing and configuring directory services infrastructure, directory roles and services, creating and managing directory objects, maintaining the directory services environment, configuring certificate services, and documenting development activities.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop energy sector directory services: A Configuring directory integrated name resolution. B Installing and configuring a directory services infrastructure. C Configuring directory services roles and services. D Creating and maintaining directory services objects. E Maintaining the directory environment F Configuring certificate services G Documenting directory services development activities. H Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEED149A DEVELOP ENERGY SECTOR COMPUTER NETWORK APPLICATIONS INFRASTRUCTURE

Locations: Industry, Sunshine.

Prerequisites:UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers developing an applications infrastructure for energy sector enterprise computer networks. It encompasses safe working practices, deploying servers, configuring remote desktop services, configuring a web services infrastructure, configuring network application servers, documenting development activities.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop energy sector network services: A Establishing network applications infrastructure to be developed. B Configuring management components of the network applications infrastructure. C Configuring security components of the network applications infrastructure. D Identifying and rectifying network malfunctions. E Developing solutions to optimise network performance. F Documenting network applications infrastructure development activities. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE011B MANAGE RISK IN ELECTROTECHNOLOGY ACTIVITIES

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers managing risk related to OHS, environment, resources and financial viability. It encompasses identifying risk events, the likelihood and consequences of such events, evaluating risk, risk management planning and mitigation of risk.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEE011C MANAGE RISK IN ELECTROTECHNOLOGY ACTIVITIES

Locations: Industry, Sunshine.

Prerequisites:UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers managing risk related to OHS, environment, resources and financial viability. It encompasses identifying risk events, the likelihood and consequences of such events, evaluating risk, risk management planning and mitigation of risk.

Required Reading:VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Manage risk in electrotechnology activities: A Identifying potential, perceived and actual risk events. B Using risk management methods, tools and techniques in analysis and reporting. C Incorporating in the risk management strategies OHS risk control measure and condition monitoring of plant and equipment with criteria for its repair and/or replacement. D Incorporating risk management processes and procedures into program and project plans. E Monitoring and responding risk events effectively. F Identifying improvements and documenting recommendation for their inclusion in ongoing or future programs and projects. G Dealing with unplanned events Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE015B DEVELOP DESIGN BRIEFS FOR ELECTROTECHNOLOGY PROJECTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing requirement to be incorporated in to the design of electrotechnology projects. It encompasses determining the safety requirements to be met, establishing client expectations, ensuring cost effective solutions are pursued and documenting design requirements.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop design briefs for electrotechnology projects: A Establishing the scope and parameters of the project. B Determining the impact of other related works. C Developing design brief incorporating scenarios and all requirements. D Identifying competencies required for the project. E Documenting project plan proposal. F Negotiating alterations to the proposed design brief successfully. G Obtaining approval of the final brief. H Dealing with unplanned events by drawing on Assessments may include: - practical assessment - work projects -

demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE017B IMPLEMENT AND MONITOR OHS POLICIES AND PROCEDURES

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the mandatory requirements of persons in a supervisory role to implement and monitor an organisation's occupational health and safety policies, procedures and programs. It encompasses understanding an organisation's OHS obligations, providing safety information to staff, implementing and monitoring participative arrangements, safety procedures and training and maintaining safety records.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEE080A APPLY INDUSTRY AND COMMUNITY STANDARDS TO ENGINEERING ACTIVITIES

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers the industry and community standards expected of engineers. It encompasses knowledge and application of ethical and community standards, seeking advise regarding broader implications of engineering works, adopting appropriates technologies and engaging in current engineering issues.

Required Reading: VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts: A Reviewing and understanding ethical standards B Seeking advice on applying standards C Contributing to periodic review of standards D Working ethically E Ensuring work outcomes are compliant with relevant standards F Seeking advice on engineering issues and adoption o Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE081A APPLY MATERIAL SCIENCE TO SOLVING ELECTROTECHNOLOGY ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers the application of materials for a specific purpose in electrotechnology. It encompasses working safely, knowledge of materials science including classifications, characteristics and any impact a material may have on health and the environment, the processes of corrosion and degradation, how particular materials are used, solving electrotechnology problems involving of materials for a particular application and documenting justification for such solutions.

Required Reading: VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Evaluate base materials: A Obtaining and understanding nature of the electrotechnology problem and environment in which the materials are to be used B Appropriate tools, equipment and testing devices are selected C Using knowledge of the material science, tests and measurement results effectively. D Considering environment and health risks E Clearly documenting proposed solutions and their scientific justification G Dealing with unplanned events Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks.

UEENEEE082A APPLY PHYSICS TO SOLVING ELECTROTECHNOLOGY ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers the law of physics and how they apply to solving electrotechnology related problems. It encompasses working safely, knowledge of measurements of physical phenomena, linear and angular motion, harmonic motion, wave theory, optics, acoustics and heat capacity and transfer, use of measurement techniques, solving physics related problems and documenting justification for such solutions.

Required Reading: VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop solution to problems in statics and dynamics: A Understanding and clearly stating the nature of the problem B Obtaining the appropriate equipment and testing devices needed to develop solutions to problems C Using knowledge of laws of physics are drawn to develop resolutions problems in static and dynamics D Applying theoretical and measured values to developing solutions to problems in static and dynamics E Consideration is given to adverse effects in the developed solutions F Reporting accurately the developed solutions, recommendations and justification G Dealing with unplanned events Assessments may include: - practical assessment - work projects - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE083A ESTABLISH AND FOLLOW A COMPETENCY DEVELOPMENT PLAN IN AN ELECTROTECHNOLOGY ENGINEERING DISCIPLINE

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers establishing and following a plan for one's own competency development. It encompasses establishing a plan in consultation with the enrolling registered training organisation (RTO), following industry/enterprise procedures regarding how work is conducted, understanding responsibilities and obligations under competency development plan, following activities for developing competency, pursuing opportunities to develop competencies, to self-monitoring competency development and meeting obligations for periodic reporting of competency development activities.

Required Reading: VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Participate in electrical work and competency development activities: A Establishing a competency development plan in consultation with the enrolling Registered Training Organisation (RTO). B Understanding obligations and expectations of the competency development plan. C Understand industry/enterprise workplace policies and procedures D Following work instructions and seeking clarification of how particular work is to be carried out and the procedures involved. E Dealing with unexpected situations in accordance with industry/enterprise policies and procedures, and with the approval of an authorised person F Reporting periodically the competency development activities in accordance with requirements G Periodically reviewing progress of the competency development activities in accordance with requirements H Pursuing strategies to develop opportunities for gaining the range of workplace experiences and exposure I Progressing successfully against periodic or staged evaluative performance events G Seeking assistance to overcome difficulties in developing competency K Dealing with unplanned events. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE117A IMPLEMENT AND MONITOR ENERGY SECTOR OHS POLICIES AND PROCEDURES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the mandatory requirements of persons in a supervisory role to implement and monitor an organisation's occupational health and safety policies, procedures and programs. It encompasses understanding an organisation's OHS obligations, providing safety information to staff, implementing and monitoring participative arrangements, safety procedures and training and maintaining safety records.

Required Reading:VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Implement and monitor energy sector OHS policies and procedures: A Providing OHS information to the work group. B Implementing and monitoring participative arrangements for the management of OHS. C Implementing and monitoring the procedures for identifying procedures for identifying hazards, assessing risks and controlling risks. D Implementing the procedures for dealing with hazardous events. E Implementing and monitoring the procedures for OHS. F Implementing and monitoring the procedures for maintaining OHS records. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE121A PLAN AN INTEGRATED CABLING INSTALLATION SYSTEM

Locations: Industry, Sunshine.

Prerequisites:UEENEEE107A - USE DRAWINGS, DIAGRAMS, SCHEDULES, STANDARDS, CODES AND SPECIFICATIONSUEENEEG106A - TERMINATE CABLES, CORDS AND ACCESSORIES FOR LOW VOLTAGE CIRCUITSUEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACEUEENEEE102A - FABRICATE, DISMANTLE, ASSEMBLE OF UTILITIES INDUSTRY COMPONENTSUEENEEE105A - FIX AND SECURE ELECTROTECHNOLOGY EQUIPMENT

Description: This unit covers the planning of cable routes for intelligent power and lighting, information and communications, entertainment systems, distributed video and audio; energy management and control; security and safety; digital home health; age and assisted living;. This unit encompasses determining immediate and future cabling needs of an installation and their origins and termination points, planning cable routes, specifying cable types, sizes, fixing/support methods and cable identification systems and documenting cabling plans based on calculated and/or deemed-to-comply solutions as well as the planning of the wiring hub if required.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Plan integrated cabling installations: A Determining immediate and future cabling needs accurately. B Choosing appropriate type and size of cables for the immediate and future services. C Planning cable routes and specifying effective support and protection method. D Developing effective cable identification scheme. E Specifying compliant termination methods for cables intended for future use. F Documenting cabling plan including supporting justification. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE124A COMPILE AND PRODUCE AN ENERGY SECTOR DETAILED REPORT

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers complying and producing an energy sector report. It encompasses determining the safety requirements are met and all regulatory responsibilities are adhered to. The person competent in this unit must demonstrate an ability to identify information sources and collect and analyse and format information applicable to the electrotechnology industry and produce a report as required.

Required Reading:VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Compile and produce an energy sector report: A Typical organisation policies and procedures. B Access to a report brief to established report parameters. C Access to appropriate person(s) to establish report requirements. D Establishing the scope and parameters of the report. E Determining the impact of other related works. F Developing design brief incorporating scenarios and all requirements. G Appropriate computer application. H Identifying competencies required for the report. I Documenting report proposal. J Negotiating alterations to the proposed report successfully. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE125A PROVIDE SOLUTIONS TO COMPLEX MULTIPLE PATH CIRCUITS PROBLEMS

Locations: Industry, Sunshine.

Prerequisites:UEENEEE126A - PROVIDE SOLUTIONS TO BASIC ENGINEERING COMPUTATIONAL PROBLEMS

Description: This unit covers determining correct operation of complex multiple path circuits and providing engineering solutions as they apply to various branches of electrotechnology work functions. It encompasses working safely, problem solving procedures, including using electrical measuring devices, applying appropriate circuit theorems and providing solutions derived from measurements and calculations and justification for such solutions.

Required Reading:VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Solve problems in complex multiple path circuits: A Determining the operating parameters of existing circuit. B Using established problem solving methods. C Taking relevant measurements accurately. D Interpreting measured values appropriately. E Providing effective solutions to circuit problems from measurements and calculations. F Giving written justification of solutions provided. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE126A PROVIDE SOLUTIONS TO BASIC ENGINEERING COMPUTATIONAL PROBLEMS

Locations: Industry, Sunshine.

Prerequisites:UEENEEG102A - SOLVE PROBLEMS IN LOW VOLTAGE A.C. CIRCUITSUEENEEH014B - TROUBLESHOOT FREQUENCY DEPENDENT CIRCUITS

Description: This unit covers the application of computational processes to solve engineering problems. It encompasses working safely, applying problem solving techniques, using a range of mathematical processes, providing solutions to electrical/electronics engineering problems and justifying such solutions.

Required Reading:VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Provide computational solutions to basic engineering problems: A Clearly stating problems in written and diagrammatic form. B Obtaining known constants and variable from an appropriate source. C Solving problems using appropriate mathematical processes. D Documenting justification of solutions provided in accordance with professional standards. E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE127A USE ADVANCED COMPUTATIONAL PROCESSES TO PROVIDE SOLUTIONS TO ENERGY SECTOR ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites:UEENEEE126A Provide solutions to basic engineering computational problems AND UEENEEE129A Solve electrotechnical engineering problems OR UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace UEENEEE104A Solve problems in d.c. circuits UEENEEG101A Solve problems in electromagnetic devices and related circuits OR UEENEEH114A Troubleshoot resonance circuits in an electronic apparatus UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace AND UEENEEE104A Solve problems in d.c. circuits OR UEENEEH169A Solve problems in basic electronic circuits

Description: This unit covers the application of advanced computational processes to solve energy sector engineering problems. It encompasses working safely, applying problem solving techniques, using a range of advanced mathematical processes, providing solutions to electrical/electronics engineering problems and justifying such solutions.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Use advanced computational processes to provide solutions to energy sector engineering: A Clearly stating problems in written and diagrammatic form. B Obtaining known constants and variable from an appropriate source. C Solving problems using appropriate advanced mathematical processes. D Documenting justification of solutions provided in accordance with professional standards. E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE128A DEVELOP ENGINEERING SOLUTIONS TO PHOTONIC SYSTEM PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing engineering solutions to resolve problems with photonic systems. It encompasses working safely; apply extensive knowledge of photonic technologies and their application, gathering and analysing data, and applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop engineering solutions to photonic problems: A Understanding the extent of the photonic system problems. B Forming effective strategies for solution development and implementation. C Obtaining photonic system parameters, specifications and performance requirements appropriate to each problem. D Testing and solutions to photonic system problems. E Documenting instruction for implementation of solutions that incorporate risk control measure to be followed. F Documenting justification of solutions implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE146A IDENTIFY EFFECTS OF ENERGY ON MACHINERY AND MATERIALS IN AN ENERGY SECTOR ENVIRONMENT

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers effects of energy on machinery and/or materials used in an energy sector environment are identified and completed in an agreed time, to a quality standard and using appropriate technology mediums, where required. It encompasses working safely, applying knowledge of identifying the effects of energy on machinery and materials in an electrotechnology environment.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Identify effects of energy on machinery and materials in an energy sector environment: A Understanding work instruction. B Obtaining and checking tools and equipment. C Following work schedules. D Identifying the effects of energy appropriately. E Returning tools and surplus resources as required. F Updating work records. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEE150A UNDERTAKE COMPUTATIONS IN AN ENERGY SECTOR ENVIRONMENT

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers computational and mathematical procedures to solve problems or to enhance given data. It encompasses working safely, applying knowledge of undertaking computations in energy sector environment.

Required Reading: VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Undertake computations in an energy sector environment: A Understanding transporting instructions. B Checking transport details against job instruction. C Obtaining relevant plant and equipment. D Transporting plant and equipment in accordance with requirements. E Undertaking computations in accordance with requirements. F Notifying work completing. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEE160A PROVIDE ENGINEERING SOLUTIONS FOR USES OF MATERIALS AND THERMODYNAMIC EFFECTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the engineering solution for the appropriate selection and use of materials and thermodynamic effects relative to an electrotechnology problem. It encompasses working safely, problem solving procedures, including using measuring instruments, applying appropriate theorems and providing solutions derived from measurements and calculations and justification for such solutions.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Provide solutions for uses of materials and thermodynamic effects: A Determining the characteristics and application of materials and the effects of thermodynamics. B Using established problem solving methods. C Taking relevant measurements accurately. D Interpreting measured values appropriately. E Providing effective solutions to system problems from measurements and calculations. F Giving written justification of solutions provided. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEE161A ANALYSE STATIC AND DYNAMIC PARAMETERS OF ELECTRICAL EQUIPMENT

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the analysis of static and dynamic parameters of electrical equipment associated with plant and machinery. It encompasses working safely, applying extensive knowledge of equipment operation and construction and its application, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Analyse static and dynamic parameters of equipment: A Understanding the operation of machines. B Forming effective strategies for analysing machine performance. C Obtaining machine parameters, specifications and performance requirements appropriate to each situation. D Testing the results of the analysis. E Documenting instruction for implementing any actions resulting from the analysis that incorporates risk control measure to be followed. F Documenting justification of actions to be implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEE162A SELECT DRIVE COMPONENTS FOR ELECTRICAL EQUIPMENT DESIGN

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the selection of drive components based on design concepts for the operation of plant and electrical equipment. It encompasses working safely, applying extensive knowledge of drive component operation and characteristics, their application, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Selecting drive components for equipment design: A Understanding drive components relative to engineering design concepts. B Forming effective strategies for selecting drive components. C Obtaining drive component parameters, specifications and performance requirements appropriate to each situation. D Testing the results of the selection. E Documenting instruction for implementing any actions resulting from the selection that incorporates risk control measure to be followed. F Documenting justification of actions to be implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEE163A ANALYSE MATERIALS FOR SUITABILITY IN ELECTRICAL EQUIPMENT

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the analysis of materials for their suitable use in the construction of electrical equipment. It encompasses working safely apply extensive knowledge of materials and their properties as they relate to equipment construction and operation, gathering and analysing data, applying problem solving techniques, developing and documenting findings, solutions and providing alternatives.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Analyse materials for suitability in equipment: A

Understanding the material properties. B Forming effective strategies for analysing machine performance. C Obtaining machine characteristics, specifications and performance requirements appropriate to each situation. D Testing the results of the analysis. E Documenting instruction for implementing any actions resulting from the analysis that incorporates risk control measure to be followed. F Documenting justification of actions to be implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEE164A DESIGN ELECTRICAL MACHINE DRIVES AND PRODUCTION LAYOUT PLANS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design of electrical machine drives and the layout of machinery for the efficient production of goods produced by automated equipment. It encompasses working safely, applying extensive knowledge of machine drives and equipment layout arrangements, their application, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design machine drives and production layout plans: A Understanding machine design and production layout issue relative to engineering design concepts. B Forming effective strategies for machine designs and plant layout. C Obtaining parameters, specifications and performance requirements appropriate to each situation. D Testing the results of the design and/or layout. E Documenting instruction for implementing any actions resulting from the design and layout that incorporate risk control measure to be followed. F Documenting justification of actions to be implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEE190A PREPARE ENGINEERING DRAWINGS USING MANUAL DRAFTING AND CAD FOR ELECTROTECHNOLOGY/UTILITIES APPLICATIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the preparation of, and modification of, preliminary engineering drawings for electrotechnology/ utilities applications using manual drafting methods and computer-aided design (CAD) equipment and software from specifications, layouts, sketches or verbal instructions in conformance with Australian Standards and enterprise standards.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Prepare electrotechnology/ utilities engineering drawings using manual drafting and CAD applications: A Carrying out freehand sketching of simple electrotechnology/ utilities products, and components using pictorial methods to generate two and three dimensional electrotechnology/ utilities images encompassing a range of standard components, such as devices, components, parts, equipment and structures, sketched together with other solid and hollow items. B Preparing and modifying preliminary electrotechnology/ utilities drawings and diagrams using manual drafting methods, techniques, procedures and devices C Preparing and modifying preliminary electrotechnology/ utilities drawings and diagrams using computer-aided design equipment and software D Notating type, form and size of materials from information, abbreviations and symbols supplied on electrotechnology/ utilities drawings, briefs and/or specifications. E Obtaining specifications from design information, customer requirements, sketches, preliminary layouts and/or field investigations. F Drawing single part components, simple electrotechnology/ utilities assemblies for fabrication, assembly or installation of products encompassing dimensions, fabrication and/or installation notes, and parts lists from predetermined dimensions, associated tolerances and design specifications Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEE191A PREPARE ELECTROTECHNOLOGY/UTILITIES DRAWINGS USING MANUAL DRAFTING AND CAD EQUIPMENT AND SOFTWARE

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the preparation of, and modification of, preliminary electrotechnology/utilities drawings and diagrams using manual drafting methods, techniques, procedures and devices and computer-aided design equipment and software from specifications, layouts, sketches or verbal instructions in conformance with Australian Standards and enterprise standards.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Preparation of electrotechnology/utilities drawings using manual drafting and CAD equipment and software: A Carrying out freehand sketching of simple electrotechnology/ utilities products, circuits and components using pictorial methods to generate two and three dimensional electrotechnology/ utilities images encompassing a range of standard components, such as devices, components, parts, equipment and structures, sketched together with other solid and hollow items. B Preparing and modifying preliminary electrotechnology/utilities drawings and diagrams using manual drafting methods, techniques, procedures and devices C Preparing and modifying preliminary electrotechnology/utilities drawings and diagrams using computer-aided design equipment and software D Notating type, form and size of materials from information, abbreviations and symbols supplied on electrotechnology/ utilities drawings, briefs and/or specifications. E Obtaining specifications from design information, customer requirements, sketches, preliminary layouts and/or field investigations. F Drawing single part components, simple electrotechnology/ utilities assemblies and circuits for fabrication, assembly or installation of products encompassing dimensions, fabrication and/or installation notes, wiring schedules and parts lists from predetermined dimensions, associated tolerances and design specifications Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEF104A INSTALL AND MODIFY PERFORMANCE DATA COMMUNICATION COPPER CABLING

Locations: Industry, Sunshine.

Prerequisites:UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACEUEENEEE102A - FABRICATE, DISMANTLE, ASSEMBLE OF UTILITIES INDUSTRY COMPONENTSUEENEEE104A - SOLVE PROBLEMS IN D.C. CIRCUITSUEENEEE105A - FIX AND SECURE ELECTROTECHNOLOGY EQUIPMENTUEENEEE107A - USE DRAWINGS, DIAGRAMS, SCHEDULES, STANDARDS, CODES AND SPECIFICATIONSUEENEEF102A - INSTALL AND MAINTAIN CABLING FOR MULTIPLE ACCESS TO TELECOMMUNICATION SERVICES
Description: This unit covers the installation and termination of high performance data copper cabling in buildings and premises and intended for connection a telecommunications network. It encompasses working safely and to standards, installing multiple data lines and backbones using structured twisted pair cabling, terminating at distributors, termination modules and in socket outlets, testing and compliance checks and completing cabling documentation.
Required Reading:VU produced Workbooks
Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Install and modify performance data communication structured cabling: A Reading and interpreting drawings related to cable layouts, cable schedules and apparatus locations. B Routing, placing and securing cables to comply with requirements C Maintaining fire integrity D Preparing and terminating each type of cable to comply with requirements. E Conducting cable performance test accurately F Identifying and rectifying anomalies G Completing the necessary documentation accurately. H Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG035B DIAGNOSE AND RECTIFY FAULTS IN A.C. MOTOR DRIVE SYSTEMS

Locations: Footscray Nicholson, Sunshine.
Prerequisites: Nil.
Description: This unit covers diagnosing and rectifying faults in systems controlling starting, speed, torque, power output, efficient running and braking of a.c. motors. The unit encompasses safe working practices, interpreting technical data, applying knowledge of a.c motors operating parameters to logical fault finding processes, implementing fault rectification, safety and functional testing and reporting work activities and outcomes.
Required Reading:-
Assessment: The following methods may be used in assessing units: Written objective tests; Written responses, short and extended answers; Oral test / technical interview; On job or workplace assessment; Practical / exercises; Practical projects; Assignments; Personal appraisal; Verbal assessment; Profiling.

UEENEEG047B PROVIDE COMPUTATIONAL SOLUTIONS TO POWER ENGINEERING PROBLEMS

Locations: Footscray Nicholson, Sunshine.
Prerequisites: Nil.
Description: This unit covers the application of computational processes to solving problems encountered in power engineering. It encompasses working safely, applying problem solving techniques, using a range of mathematical processes, providing solutions to power engineering problems and justifying such solutions.
Required Reading:-
Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEG048B SOLVE PROBLEMS IN COMPLEX MULTIPLE PATH POWER CIRCUITS

Locations: Footscray Nicholson, Sunshine.
Prerequisites: Nil.
Description: This unit covers the determining correct operation of complex series-parallel power circuits and providing solutions as they apply to electrical power engineering work functions. It encompasses working safely, problem solving procedures, including electrical measuring devices, applying appropriate circuit theorems and providing solutions derive from measurements and calculations and providing justification for such solutions.
Required Reading:-
Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEG049B SOLVE PROBLEMS IN COMPLEX POLYPHASE POWER CIRCUITS

Locations: Footscray Nicholson, Sunshine.
Prerequisites: Nil.
Description: This unit covers determining correct operation of complex polyphase power circuits and providing solutions as they apply to electrical power engineering work functions. It encompasses working safely, problem solving procedures, including using electrical measuring devices, applying appropriate circuit theorems and providing solutions derived from measurements and calculations and justification for such solutions.
Required Reading:-
Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEG069B MANAGE ELECTRICAL PROJECTS

Locations: Footscray Nicholson, Sunshine.
Prerequisites: Nil.
Description: This unit covers the management of electrical projects involving design, modifications, installation, and/ormaintenance of systems and equipment. The unit encompasses management of safety, budget variation, personnel, resources, critical path timelines and completion documentation. d
Required Reading:-
Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEG070B PLAN ELECTRICAL PROJECTS

Locations: Footscray Nicholson, Sunshine.
Prerequisites: Nil.
Description: This unit covers development and documentation of electrical project proposals, milestones and completions. The unit encompasses, establishing budgets, critical path analysis, development of workflow strategies, documenting, presenting

and negotiating budgets and timelines.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEG111A CARRY OUT BASIC REPAIRS TO ELECTRICAL COMPONENTS AND EQUIPMENT

Locations: Industry, Sunshine.

Prerequisites:UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACEUEENEEE102A - FABRICATE, DISMANTLE, ASSEMBLE OF UTILITIES INDUSTRY COMPONENTS

Description: This unit deals with the repair and/or replacement of mechanical and electrical components of electrical apparatus. It encompasses safe working practices, following written and oral instruction and procedures, basic testing and techniques for dismantling and assembling apparatus and disconnecting and reconnecting components

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Carry out basic repairs to electrical apparatus: A Following manufactures service instructions for access to components. B Removing at least three different types of components specified in the work instructions. C Replacing components to manufacturer's requirements. D Terminating internal wiring correctly. E Reassembling the apparatus correctly. F Testing apparatus operation. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG120A SELECT AND ARRANGE EQUIPMENT FOR SPECIAL LV ELECTRICAL INSTALLATIONS

Locations: Industry, Sunshine.

Prerequisites:UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace UEENEEE102A Fabricate, dismantle, assemble of utilities components UEENEEE104A Solve problems in d.c circuits UEENEEE105A Fix and secure electrotechnology equipment UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications UEENEEG006A Solve problems in single and three phase low voltage machines UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits UEENEEG063A Arrange circuits, control and protection for general electrical installations UEENEEG101A Solve problems in electromagnetic devices and related circuits UEENEEG102A Solve problems in low voltage a.c. circuit UEENEEG106A Terminate cables, cords and accessories for low voltage circuits UEENEEG107A Select wiring systems and cables for low voltage general electrical installations

Description: This unit covers selecting and arranging electrical equipment into distribution circuits for installations in caravan parks, construction and demolition sites, marinas, medical treatment areas and moveable premises operating at voltages up to 1,000V a.c. or 1,500 V d.c. The unit encompasses schemes for protection of persons and property, correct functioning, compatibility with the supply, arrangement of circuits and selection of switchgear, controlgear, protection devices and wiring based on calculated and deemed-to-comply solutions.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Select and arrange equipment for special electrical installations: A Arranging electrical installations to comply with safety and other regulatory and functional requirements. B Selecting appropriate type and size of cables. C Selecting protection methods and devices that meet co-ordination requirements for overload and short-circuit protection. D Selecting switchgear and control gear that meet current, voltage and IP ratings and functional requirements. E Selecting appropriate earthing components. F Documenting installation arrangement, specification for items selected and reasons for the selections made. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG125A PLAN ELECTRICAL INSTALLATIONS WITH A LOW VOLTAGE DEMAND UP TO 400 A PER PHASE

Locations: Industry, Sunshine.

Prerequisites:UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace UEENEEE102A Fabricate, dismantle, assemble of utilities components UEENEEE104A Solve problems in d.c circuits UEENEEE105A Fix and secure electrotechnology equipment UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications UEENEEG006A Solve problems in single and three phase low voltage machines UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits UEENEEG063A Arrange circuits, control and protection for general electrical installations UEENEEG101A Solve problems in electromagnetic devices and related circuits UEENEEG102A Solve problems in low voltage a.c. circuit UEENEEG106A Terminate cables, cords and accessories for low voltage circuits UEENEEG107A Select wiring systems and cables for low voltage general electrical installations

Description: This unit covers the planning of circuit and equipment for electrical installations where standardised arrangements for service and CT metering equipment are used, not exceeding 400 A per phase. This encompasses schemes for protection of persons and property, correct functioning, compatibility with the supply, arrangement of circuits, metering and control, cable route planning, specifying type and rating of switchgear, controlgear, protection devices and wiring based on calculated and deemed-to-comply solutions and planning documentation.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Plan electrical installations with a LV demand up to 400 A per phase: A Arranging electrical installations to comply with control, metering, safety and other regulatory and functional requirements. B Specifying appropriate type and size of cables. C Specifying protection methods and devices that meet co-ordination requirements for overload and short-circuit protection. D Specifying switchgear and control gear that meet fault level, current, voltage and IP ratings and functional requirements. E Selecting appropriate earthing system components. F Documenting installation plan, specifications of equipment, equipment locations, cable routes and schedules and supporting calculations. G Arranging electrical installations to comply with control, metering, safety and other regulatory and functional requirements. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG127A DESIGN ELECTRICAL INSTALLATIONS WITH A LOW VOLTAGE DEMAND GREATER THAN 400 A PER PHASE

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace UEENEEE102A Fabricate, dismantle, assemble of utilities components UEENEEE104A Solve problems in d.c circuits UEENEEE105A Fix and secure electrotechnology equipment UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications UEENEEG006A Solve problems in single and three phase low voltage machines UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits UEENEEG063A Arrange circuits, control and protection for general electrical installations UEENEEG101A Solve problems in electromagnetic devices and related circuits UEENEEG102A Solve problems in low voltage a.c. circuit UEENEEG106A Terminate cables, cords and accessories for low voltage circuits UEENEEG107A Select wiring systems and cables for low voltage general electrical installations UEENEEG125A Plan electrical installations with a low voltage demand up to 400 A per phase

Description: This unit covers the design of supply and distribution arrangements, control, protection and selection of equipment for electrical installations with low voltage demand greater than 400 amperes per phase. This encompasses designing schemes for protection of persons and property and correct functioning, compatibility with the supply, and arrangement of circuits, determination of fault levels, effective switchgear, control gear, and protection against over current and over and under voltage and wiring based on calculations to meet required safety and performance standards and functional requirements.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design electrical installations with a LV demand greater than 400 A per phase: A Developing outlines of alternative designs. B Developing the design within the safety and functional requirements and budget limitations. C Documenting and presenting design effectively. D Successfully negotiating design alteration requests. E Obtaining approval for final design. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEG128A PLAN LOW VOLTAGE SWITCHBOARD AND CONTROL PANEL LAYOUTS

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A Apply Occupational Health and Safety regulations, codes and practices in the workplace UEENEEE102A Fabricate, dismantle, assemble of utilities components UEENEEE104A Solve problems in d.c circuits UEENEEE105A Fix and secure electrotechnology equipment UEENEEE107A Use drawings, diagrams, schedules, standards, codes and specifications UEENEEG006A Solve problems in single and three phase low voltage machines UEENEEG033A Solve problems in single and three phase electrical apparatus and circuits UEENEEG063A Arrange circuits, control and protection for general electrical installations UEENEEG101A Solve problems in electromagnetic devices and related circuits UEENEEG102ASolve problems in low voltage a.c. circuit UEENEEG106ATerminate cables, cords and accessories for low voltage circuits UEENEEG107A Select wiring systems and cables for low voltage general electrical installations

Description: This unit covers selecting and arranging equipment in electrical switchboards and control panels operating at voltages up to 1,000V a.c. or 1,500 V d.c. and fault levels not exceeding 20 kA. The unit encompasses arrangements for protection of persons and property, correct functioning, compatibility with the supply, and intended arrangement of circuits and selection of switchgear, controlgear and protection devices based on calculated and deemed-to-comply solutions and planning documentation.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Plan switchboard and control panel layouts: A Developing outlines of alternative layouts. B Selecting equipment that complies with safety and functional requirements and budget limitations. C Developing the layout within the safety and functional requirements and budget limitations. D Successfully negotiating layout alteration requests. E Obtaining approval for final layout design. F Documenting layout and equipment specifications clearly. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG130A DESIGN SWITCHBOARDS RATED FOR HIGH FAULT LEVELS (GREATER THAN 400 A)

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design of supply and distribution arrangements, control, protection and selection of equipment for switchboards with low voltage demand greater than 400 amperes per phase. This encompasses designing schemes for protection of persons and property and correct functioning, compatibility with the supply, and arrangement of circuits, determination of fault levels, effective switchgear, control gear, and protection against over current, over and under voltage and wiring based on calculations to meet required safety and performance standards and functional requirements.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design switchboards rated for high fault levels: A Developing outlines of alternative designs. B Developing the design within the safety and functional requirements and budget limitations. C Documenting and presenting design effectively. D Successfully negotiating design alteration requests. E Obtaining approval for final design. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG131A EVALUATE PERFORMANCE OF LOW VOLTAGE ELECTRICAL APPARATUS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers testing of electrical apparatus for compliance with a standard and regulation for the purpose of certification, approval and/or product quality maintenance. The unit encompasses safe working practices, determining performance requirements, inspecting, setting up performance tests, evaluating inspection and test results and documenting test outcomes.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Evaluate performance of electrical apparatus: A Interpreting compliance documents. B Setting up and conducting appropriate examinations and tests. C Identifying non-compliance issues. D Reporting examination and test results and non-compliance issues clearly and accurately. E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEG143A DEVELOP ENGINEERING SOLUTION FOR SYNCHRONOUS MACHINE AND CONTROL PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing engineering solutions to resolve problems with synchronous machines and their controls. It encompasses working safely, apply extensive knowledge of synchronous machine operation, construction and their application, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop engineering solution for synchronous machine problems: A Understanding the extent of the machine problem. B Forming effective strategies for solution development and implementation. C Obtaining machine parameters, specifications and performance requirements appropriate to each problem. D Testing and solutions to machine problems. E Documenting instruction for implementation of solutions that incorporate risk control measure to be followed. F Documenting justification of solutions implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEG144A DEVELOP ENGINEERING SOLUTIONS FOR D.C. MACHINE AND CONTROL PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing engineering solutions to resolve problems with d.c. machines and their controls. It encompasses working safely; apply extensive knowledge of d.c machine operation and construction and their application, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop engineering solutions for d.c. machine problems: A Understanding the extent of the machine problem. B Forming effective strategies for solution development and implementation. C Obtaining machine parameters, specifications and performance requirements appropriate to each problem. D Testing and solutions to machine problems. E Documenting instruction for implementation of solutions that incorporate risk control measure to be followed. F Documenting justification of solutions implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG145A DEVELOP ENGINEERING SOLUTIONS FOR INDUCTION MACHINE AND CONTROL PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing engineering solutions to resolve problems with induction machines and their controls. It encompasses working safely; apply extensive knowledge of induction machine operation and construction and their application, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop engineering solutions for induction machine problems: A Understanding the extent of the machine problem. B Forming effective strategies for solution development and implementation. C Obtaining machine parameters, specifications and performance requirements appropriate to each problem. D Testing and solutions to machine problems E Documenting instruction for implementation of solutions that incorporate risk control measure to be followed. F Documenting justification of solutions implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEG149A PROVIDE ENGINEERING SOLUTIONS TO PROBLEMS IN COMPLEX POLYPHASE POWER CIRCUITS

Locations: Industry, Sunshine.

Prerequisites: UEENEEE125A - PROVIDE SOLUTIONS TO COMPLEX MULTIPLE PATH CIRCUITS PROBLEMSUEENEEG102A - SOLVE PROBLEMS IN LOW VOLTAGE A.C. CIRCUITS

Description: This unit covers determining correct operation of complex polyphase power circuits and providing solutions as they apply to electrical power engineering work functions. It encompasses working safely, problem solving procedures, including using electrical measuring devices, applying appropriate circuit theorems and providing solutions derived from measurements and calculations and justification for such solutions.

Required Reading: VU Produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Solve problems in complex polyphase power circuits: A

Determining the operating parameters of existing circuit. B Using established problem solving methods. C Taking relevant measurements accurately. D Interpreting measured values appropriately. E Providing effective solutions to circuit problems from measurements and calculations. F Giving written justification of solutions provided. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG160A EVALUATE PERFORMANCE OF LV ELECTRICAL MACHINES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers electrical and mechanical safety and performance evaluation of electrical machines across their load range. The unit encompasses working safely, setting up and conducting evaluation measurements, evaluating performance from measured parameters and documenting results and recommending any resulting corrective actions.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Evaluate performance of electrical machines: A Interpreting compliance documents. B Setting up and conducting appropriate examinations and tests. C Identifying non-compliance defects. D Reporting examination and test results and non-compliance issues clearly and accurately. E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEG161A DESIGN AND DEVELOP MODIFICATIONS TO LV ELECTRICAL MACHINES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the performance and efficiency aspects of electrical machine design as applied to the modification of existing machines. It encompasses designing to given parameters including those related to safety and efficiency, adhering to compliance standards and compliance assessments and documentation.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design and develop modifications to electrical machines as described as described in 8) and including: A Determining the extent of work correctly. B Designing modification to meet requirements. C Documenting modification specifications clearly. D Arranging for formal certification of modifications. E Completing final report. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG169A MANAGE LARGE ELECTRICAL PROJECTS

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers the management of large electrical projects involving design, modifications, installation, and/or maintenance of systems and equipment. The unit encompasses management of safety, budget variation, personnel, resources, critical path timelines and completion documentation.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Manage electrical projects as described in 8) and including: A Establishing the scope of the project accurately. B Ascertaining the input a project. C Developing effective management processes. D Managing resources and variations effectively. E Resolving conflicts. F Adopting risk management strategies. G Maintaining records and submitting progress reports. H Meeting project outcomes. I Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG170A PLAN LARGE ELECTRICAL PROJECTS

Locations: Industry, Sunshine.

Prerequisites: UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACE

Description: This unit covers development and documentation of large electrical project proposals, milestones and completions. The unit encompasses, establishing budgets, critical path analysis, development of workflow strategies, documenting, presenting and negotiating budgets and timelines.

Required Reading: VU Produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Plan electrical projects as described in 8) and including: A Determining the project requirements accurately. B Establishing a project budget. C Developing effective work flow strategies. D Documenting project plan proposal. E Negotiating alterations to the proposed project plan successfully. F Obtaining approval of the final plan. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG179A DEVELOP DETAILED ELECTRICAL DRAWINGS

Locations: Industry, Sunshine.

Prerequisites: UEENEED104A - USE SOFTWARE FOR ENGINEERING APPLICATIONSUEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACEUEENEEE102A - FABRICATE, DISMANTLE, ASSEMBLE OF UTILITIES INDUSTRY COMPONENTSUEENEEE104A - SOLVE PROBLEMS IN D.C. CIRCUITSUEENEEE107A - USE DRAWINGS, DIAGRAMS, SCHEDULES, STANDARDS, CODES AND SPECIFICATIONSUEENEEE190A - PREPARE ENGINEERING DRAWINGS USING MANUAL DRAFTING AND CAD FOR ELECTROTECHNOLOGY/UTILITIES APPLICATIONSUEENEEE191A - PREPARE ELECTROTECHNOLOGY/UTILITIES DRAWINGS USING MANUAL DRAFTING AND CAD EQUIPMENT AND SOFTWARE

Description: This unit covers the production of detailed electrical drawings, drawing sets and documentation. It includes safe working practices; interpreting technical data and specifications; using advanced computer-aided systems and commands and appropriate drafting peripheral systems, equipment and tools to develop detailed drawings. It also includes applying knowledge of electrical equipment design drawing methods, techniques, procedures and protocols and documenting design, storing and retrieving data, and producing related documentation for presentation of preliminary and final drafts for verification.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Produce detailed electrical drawings as described in 8) Range and including: A Producing a variety of detailed electrical drawings B Producing drawing sets C Producing drafting documentation D Interpreting and using technical data and specifications E Selecting components and materials F Using advanced computer-aided systems and commands G Using relevant drafting peripheral systems, equipment and tools to develop detailed drawings H Digitising and scanning drafting/drawings products I Applying knowledge of electrical equipment design drawing methods, techniques, procedures and protocols and documenting design J Applying knowledge related to storing and retrieving data, and producing related documentation for presentations K Presenting preliminary and final drafts for verification Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG180A DEVELOP DETAILED AND COMPLEX DRAWINGS FOR ELECTRICAL SYSTEMS USING CAD SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: Develop detailed and complex drawings for electrical systems using computer aided design (CAD) systems to meet design specification. It includes 2D and 3D drawing formats covering a representative range of electrical systems such as installations with alternative supplies, installations over 400 A per phase at low voltage and/or high voltage, single or multi tenancies, heavy plant, switchgear, protection systems, earthing, power factor correction, control equipment, and energy monitoring and management.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Develop detailed and complex drawings for electrical systems as described in 8) Range and including: A Developing a variety of detailed and complex electrical drawings B Producing drawing sets C Producing drafting documentation D Interpreting and using technical data and specifications E Selecting components and materials F Developing 2D and 3D computer based models using computer based modelling, design and drafting systems G Applying graphical techniques to produce products, processes, systems or services designs representations H Presenting designs of electrical engineering products, processes, systems or services I Incorporating feedback into final products J Verifying and presenting final drafts K Managing, processing, storing and retrieving drafting data L Using advanced computer-aided systems and commands M Using relevant drafting peripheral systems, equipment and tools encompassing digitising and scanning equipment to develop detailed and complex drawings Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG182A SUPPLY EFFECTIVE AND EFFICIENT LIGHTING PRODUCTS FOR DOMESTIC AND SMALL COMMERCIAL APPLICATIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers responding to customer request for the supply of effective and efficient luminaries and associated control and mounting apparatus. It encompasses working safely, a knowledge of luminaries, their application and parameters, energy efficiency and safety compliance requirements and regulations, interrogating customer requests, extracting information from manufacturer's catalogues and technical data and supplying the most appropriate and compliant fittings.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Engaging with customers to supply appropriate lighting products for domestic applications as described in 8) and including: A Communication with customers in a professional manner and responding promptly to enquiries B Clearly ascertain the most suitable lighting products. C Advising customers of technical and compliance aspects that need to be considered when choosing lighting products. D Providing customers with information about available options and assisted to identify their preferred option. E Supplying lighting produces as agreed with the customer and in accordance with established policy and procedures. F Dealing with unplanned events Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG183A PROVIDE ADVICE ON THE APPLICATION OF ENERGY EFFICIENT LIGHTING FOR AMBIENT AND AESTHETIC EFFECT

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers advising customers on energy efficient lighting for ambient and aesthetic effects. It encompasses a basic knowledge of lighting principles, light source types, effects of colour, visual perception and interpreting manufacturers' technical data and documenting advice given.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Providing advice on the application of lighting for ambient and aesthetic effect as described in 8) and including: A Determining the nature of the advice required B Reviewing appropriate lighting documentation and providing appropriate advice C Applying basic knowledge of lighting effects to provide relevant advice D Referring high technical and costing inquiries to an appropriate person. E Documenting inquiries and responses in accordance with routine procedures. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG184A PROVIDE PHOTOMETRIC DATA FOR ILLUMINATION SYSTEM DESIGN

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the provision of photometric data to support illumination system designs. It encompasses working safely, applying knowledge of photometric, calculations for the selecting and arranging light sources for particular applications, recognising the visual requirements of the human subject, complying with standards and documenting justification for the data provided.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Providing photometric data for illumination system design as described in 8) and including: A Obtaining illumination parameters from a design brief, job specification or by consultation with the client. B

Understanding compliance and recommended illumination parameters for particular situations and tasks. C Understanding manufacturers' technical information. D Documenting photometric data including justification for conclusions E Dealing with unplanned events Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG185A SELECT EFFECTIVE AND EFFICIENT LIGHT SOURCES AND LUMINARIES FOR GIVEN LOCATIONS AND DESIGNS

Locations: Industry, Sunshine.

Prerequisites:UEENEEG184A - PROVIDE PHOTOMETRIC DATA FOR ILLUMINATION SYSTEM DESIGN

Description: This unit covers the selecting effective and efficient light sources and luminaries for a given location and lighting design. It encompasses, applying knowledge of light sources and luminaries and given lighting design parameters, complying with standards and documenting justification for the selections made.

Required Reading:VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Providing photometric data for illumination system design as described in 8) and including: A Obtaining illumination parameters from a design brief, job specification or by consultation with the client. B Understanding compliance and recommended illumination parameters for particular situations and tasks. C Understanding manufacturers' technical information. D Selecting appropriate light sources and luminaries E Documenting selected light sources and luminaries including justification for the selections made F Dealing with unplanned events Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG186A DESIGN EFFECTIVE AND EFFICIENT LIGHTING FOR RESIDENTIAL AND COMMERCIAL BUILDINGS

Locations: Industry, Sunshine.

Prerequisites:UEENEEG184A - PROVIDE PHOTOMETRIC DATA FOR ILLUMINATION SYSTEM DESIGNUEENEEG185A - SELECT EFFECTIVE AND EFFICIENT LIGHT SOURCES AND LUMINARIES FOR GIVEN LOCATIONS AND DESIGNS

Description: This unit covers lighting design for residential and commercial buildings to provide sufficient illumination with minimal energy use. It encompasses an understanding of safety principles and photometrics, the application of design calculations, compliance standards, energy management, lighting control and available lighting products appropriate to the illumination design and fully documenting completed design.

Required Reading:VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Designing effective and efficient lighting for residential and commercial buildings as described in 8) and including: A Determining the extent and nature of the lighting requirements from a design brief. B Identifying and understanding safety and other requirements to which the lighting design shall comply. C Planning to meet scheduled timelines D Applying appropriate knowledge of lighting performance compliance and lighting equipment in designing the lighting. E Considering alternative arrangements for the lighting design F Including safety, functional, maintenance and budgetary factors in the lighting design G Documenting and presenting the lighting design H Responding appropriately to requests to alter the design. I Documenting and obtaining approval of the lighting design. J Dealing appropriately with unplanned events Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG187A DESIGN EFFECTIVE AND EFFICIENT LIGHTING FOR PUBLIC, OPEN AND SPORTS AREAS

Locations: Industry, Sunshine.

Prerequisites:UEENEEG184A - PROVIDE PHOTOMETRIC DATA FOR ILLUMINATION SYSTEM DESIGNUEENEEG185A - SELECT EFFECTIVE AND EFFICIENT LIGHT SOURCES AND LUMINARIES FOR GIVEN LOCATIONS AND DESIGNS

Description: This unit covers effective and efficient lighting design for public and open areas, such as indoor and outdoor sporting facilities, urban parks and the like, to provide sufficient illumination with minimal energy use. It encompasses an understanding of safety principles and photometrics, the application of design calculations, compliance standards, energy management, lighting control and available lighting products appropriate to the illumination design and fully documenting completed design.

Required Reading:VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -designing lighting for public, open and sports areas as described in 8) and including: A Determining the extent and nature of the lighting requirements from a design brief. B Identifying and understanding safety and other requirements to which the lighting design shall comply. C Planning to meet scheduled timelines D Applying appropriate knowledge of lighting performance compliance and lighting equipment in designing the lighting. E Considering alternative arrangements for the lighting design F Including safety, functional, maintenance and budgetary factors in the lighting design G Documenting and presenting the lighting design H Responding appropriately to requests to alter the design. I Documenting and obtaining approval of the lighting design. J Dealing appropriately with unplanned events Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEG188A PREPARE QUOTATIONS FOR THE SUPPLY OF EFFECTIVE AND EFFICIENT LIGHTING PRODUCTS FOR LIGHTING PROJECTS

Locations: Industry, Sunshine.

Prerequisites:UEENEEG184A - PROVIDE PHOTOMETRIC DATA FOR ILLUMINATION SYSTEM DESIGNUEENEEG185A - SELECT EFFECTIVE AND EFFICIENT LIGHT SOURCES AND LUMINARIES FOR GIVEN LOCATIONS AND DESIGNS

Description: This unit covers preparing quotations for supply of effective and efficient lighting products based on given specifications and/or material schedules. It encompasses knowledge of lighting and ancillary components, their application and parameters, compliance requirements, installations conditions, interpreting manufacturer's technical data, job specifications and equipment schedules and documenting quotations accurately.

Required Reading:VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -Preparing quotations for the supply of products for lighting projects as described in 8) and including: A Determining the scope of lighting products required from job specifications and discussions with customer and/or other appropriate person(s B Documenting the compliance requirements and level of service on which the quotation is to be given C Establishing timelines for submission of the quotation D Performing material take-offs accurately E Applying calculation to selecting appropriate type and quantity of lighting products F

Determined item costs from enterprise costing policy and procedures. G Check quotation against item costs and job specifications. H Documenting quotation accurately and submitting it on time. I Dealing with unplanned events Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEH025B PROVIDE SOLUTIONS TO SINGLE PHASE ELECTRONIC POWER CONTROL PROBLEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers solving problems with electronic aspects of single phase power control devices and circuits. The unit encompasses safe working practices, interpreting diagrams, applying knowledge of electronic power control devices and their application, using effective problem solving techniques, safety and functional testing and reporting work activities and outcomes.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; Written responses, short and extended answers; Oral test / technical interview; On job or workplace assessment; Practical / exercises; Practical projects; Assignments; Personal appraisal; Verbal assessment; Profiling.

UEENEEH026B PROVIDE SOLUTIONS TO POLYPHASE ELECTRONIC POWER CONTROL PROBLEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers solving problems with electronic aspects of polyphase power control devices and circuits. The unit encompasses safe working practices, interpreting diagrams, applying knowledge of electronic power control devices and their application, using effective problem solving techniques, safety and functional testing and reporting work activities and outcomes.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; Written responses, short and extended answers; Oral test / technical interview; On job or workplace assessment; Practical / exercises; Practical projects; Assignments; Personal appraisal; Verbal assessment; Profiling.

UEENEEH041B MANAGE ELECTRONICS/COMPUTER SYSTEMS PROJECTS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the management of electronics/computer systems projects involving management of safety, budget variation, personnel, resources, timelines and completion documentation.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEH044B DIAGNOSE AND RECTIFY FAULTS IN ANALOGUE CIRCUITS AND COMPONENTS IN ELECTRONIC CONTROL SYSTEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers diagnosing and rectifying faults in analogue applications in electronic control systems. The unitencompasses safe working practices, interpreting diagrams and technical data, applying knowledge of analogue circuits and components to logical fault finding processes, implementing fault rectification, safety and functional testing and reporting work activities and outcomes.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEH048B DESIGN AND DEVELOP ADVANCED DIGITAL SYSTEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design and development of advanced digital systems. It encompasses working safely, following design brief, applying knowledge of digital components/devices, interpreting device/componentspecifications, constructing prototype devices, applying programming techniques to programmable devices, testing developed system prototype operation, verifying compliance of the design against the final brief, and documenting design and development work.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEH081B DESIGN PRINTED CIRCUIT BOARDS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design of printed circuit boards. The unit encompasses application of knowledge of electronic circuits, components, component assemblies, developing alternative design schemes based on design brief, customer relations and documenting designs.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEH083B ANALYSE THE PERFORMANCE OF WIRELESS-BASED ELECTRONIC SYSTEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the analysis of wireless-based electronic systems to provide solutions to mobile communications performance. It encompasses working safely, applying extensive knowledge of mobile communications parameters, gathering and analysing data, applying problem solving techniques, developing and documenting results and solutions for use in design work.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEH088B DESIGN AND DEVELOP ELECTRONICS/COMPUTER PROJECTS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design and development of electronics/computer systems projects. It encompasses working safely, designing, constructing, recording, evaluating and reporting of an electronics/computer systems design project.
Required Reading:-
Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEH102A REPAIRS BASIC ELECTRONIC APPARATUS FAULTS BY REPLACEMENT OF COMPONENTS

Locations: Industry, Sunshine.
Prerequisites:UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACEUEENEEE102A - FABRICATE, DISMANTLE, ASSEMBLE OF UTILITIES INDUSTRY COMPONENTS
Description: This unit deals the replacement of electronic components, cabling and sub systems of electronic apparatus. It encompasses safe working practices, following written and oral instruction and procedures, basic testing and techniques, dismantling and assembling apparatus and disconnecting and reconnecting components.
Required Reading:VU produced Workbooks
Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -Carry out basic repairs to electronic apparatus by replacement of components as described in 8) and including: A Following manufacturer service instructions for access to components. B Removing at least three different types of components specified in the work instructions. C Replacing components to manufacturer requirements. D Terminating correctly electronic cables using solderless termination techniques E De-soldering and soldering to a high reliability standard and without damage to components. F Reassembling the apparatus correctly. G Testing apparatus operation. H Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEH111A TROUBLESHOOT SINGLE PHASE INPUT D.C. POWER SUPPLIES

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit covers determining correct operation of independent power supplies and power supply sections of electronic apparatus. It encompasses working safely, problem solving procedures, including the use of voltage, current and resistance measuring devices, providing solutions derived from measurements and calculations to predictable problems in d.c. power supplies with single phases input.
Required Reading:VU produced Workbooks
Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -?Troubleshoot d.c. power supplies with single phase input as described in 8) and including: A Using methodical problem solving methods. B Taking measurements correctly and accurately. C Calculating parameters correctly and accurately. D Providing solution to power supply problems, and E Providing written justification for the solutions to problems. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEH147A ASSESS ELECTRONIC APPARATUS COMPLIANCE

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit covers assessing electronic apparatus for compliance with a standard and/or regulation for the purpose of certification or approval. The unit encompasses safe working practices, determining specified requirements, inspecting, setting up performance tests, evaluating inspection and test results and documenting evaluation outcomes.
Required Reading:VU produced Workbooks
Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -?Assess compliance of electronic apparatus as described in : 8) and including: A Interpreting compliance documents. B Setting up and conducting appropriate examinations and tests. C Identifying non-compliance defects. D Reporting examination and test results and non-compliance issues clearly and accurately. E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEH150A ASSEMBLE AND SET UP BASIC SECURITY SYSTEMS

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit covers installing electronic security systems with up to 50 connected devices typically used in single domestic and small commercial premises. It encompasses, working safely and to standards, following oral and written instructions and procedures, securely placing and connecting security system components, and applying customer relation protocols.
Required Reading:VU produced Workbooks
Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -?Assemble and set up basic wired and wireless security systems as described in 8) and including: A Reading and interpreting drawings related to cable layouts and apparatus locations. B Placing and securing devices and accessories accurately. C Maintaining fire integrity. D Terminating cable and conductors correctly. E Documenting installation. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEH188A DESIGN AND DEVELOP ELECTRONICS - COMPUTER SYSTEMS PROJECTS

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit covers the design and development of electronics/computer systems projects. It encompasses working safely, designing, constructing, and recording, evaluating and reporting of an electronics/computer systems design project.
Required Reading:VU produced Workbooks
Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -Design and develop electronics/computer systems projects as described in 8) and including: a. Developing outlines of

alternative designs. b. Developing the design within the safety and functional requirements and budget limitations. c. Constructing and testing prototype hardware and/or software according to design brief and regulatory requirements. d. Documenting and presenting design effectively. e. Successfully negotiating design alteration requests. f. Obtaining approval for final design. g. Verifying compliance of the design against the final brief. h. Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI101A USE INSTRUMENTATION DRAWINGS, SPECIFICATION, STANDARDS AND EQUIPMENT MANUALS

Locations: Industry, Sunshine.

Prerequisites:UEENEEE101A - APPLY OCCUPATIONAL HEALTH SAFETY REGULATIONS, CODES AND PRACTICES IN THE WORKPLACEUEENEEE107A - USE DRAWINGS, DIAGRAMS, SCHEDULES, STANDARDS, CODES AND SPECIFICATIONS

Description: This unit covers using drawings, specifications, standards and equipment manual applicable to installing, maintaining and fault finding process controls. It encompasses the principles of process control embodied in drawings, standards, specifications and equipment manuals, matching equipment with that specified for a given function and location and determining the connections required between pneumatic, hydraulic and electrical equipment from instrumentation drawings and specifications

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE11'. Evidence shall also comprise: Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. - Representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement - Apply sustainable energy principles and practices as specified in the performance criteria and range statement - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. - Demonstrate an appropriate level of skills enabling employment - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures - Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Use instrumentation drawings, specification, standards and equipment manuals Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI116A ASSEMBLE, ENTER AND VERIFY OPERATING INSTRUCTIONS IN MICROPROCESSOR EQUIPPED DEVICES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers assembling and entering instructions in microprocessor-equipped devices (embedded system) with simple built-in programming function and verifying that the device operates as intended. It encompasses safe working practices, checking device installation, following written and oral instruction and procedures and completing necessary documentation.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE11'. Evidence shall also comprise: Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. - Representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement - Apply sustainable energy principles and practices as specified in the performance criteria and range statement - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. - Demonstrate an appropriate level of skills enabling employment - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures - Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Enter and verify operating instructions in microprocessor equipped devices Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School .

UEENEEI123A DESIGN ELECTRONIC CONTROL SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers designing electronic control systems incorporating closed loop and digital and analogue elements. It encompasses working safely, following design brief, applying knowledge of digital and analogue devices, interpreting device specifications, constructing prototypes, using appropriate development software, applying programming techniques, testing developed system prototype operation and documenting design and development work.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE11'. Evidence shall also comprise: Each element and associated performance criteria shall be demonstrated on at least two occasions in accordance with the 'Assessment Guidelines - UEE07'. - Representative body of work performance demonstrated within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: - Implement Occupational Health and Safety workplace procedures and practices, including the use of risk control measures as specified in the performance criteria and range statement - Apply sustainable energy principles and practices as specified in the performance criteria and range statement - Demonstrate an understanding of the essential knowledge and associated skills as described in this unit. It may be required by some jurisdictions that RTOs provide a percentile graded result for the purpose of regulatory or licensing requirements. - Demonstrate an appropriate level of skills enabling employment - Conduct work observing the relevant Anti Discrimination legislation, regulations, polices and workplace procedures - Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design electronic control systems Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI129A SET UP ELECTRONICALLY CONTROLLED MECHANICALLY OPERATED COMPLEX SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the setting up, adjustment, maintenance and modification to electronically controlled mechanically operated complex systems. It encompasses working safely, applying extensive knowledge of electronic circuits and the integration to mechanically operated equipment and systems, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Planning and implementing integrated systems as described in 8) and including: A Establishing customer requirements for integrated system. B Determining system components and locations from job specifications and customer requirements. C Ensuring that the power source for the integrated system is suitable D Choosing integrated system component for compatibility with loads and established scenarios E Planning integrated systems to comply with bus system and supply voltage parameters F Considering other control methods in planning the integrated system G Keeping within a given budget H Documenting integrated system plan I Arranging an integrated system using an acceptable topology J Developing a connection chart/diagram K Selecting and terminating bus cable using specified methods and polarity. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI130A SET UP ELECTRONICALLY CONTROLLED ROBOTICALLY OPERATED COMPLEX SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the setting up, adjustment, maintenance and modification to electronically controlled robotically operated complex systems. It encompasses working safely, applying extensive knowledge of electronic circuits and the integration to robotically operated equipment and systems, gathering and analysing data, applying problem solving techniques, developing and documenting solutions and alternatives.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -Set up electronically controlled robotically operated complex systems as described in 8) and including: A Understanding the operation of electronic and robot controls B Forming effective strategies for analysing circuit and robot performance C Obtaining circuit control and robot parameters, specifications and performance requirements appropriate to each situation. D Testing the results of the analysis E Documenting instruction for implementing any actions resulting from the analysis that incorporates risk control measure to be followed. F Documenting justification of actions to be implemented in accordance with professional standards. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI138A PROVIDE SOLUTIONS TO EXTRA LOW VOLTAGE (ELV) ELECTRO-PNEUMATIC CONTROL SYSTEMS AND DRIVES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing and implementing control solutions for systems using electro-pneumatic elements operating at extra-low voltage and variable speed drives. It encompasses safe working practices, establishing required control functions, checking device installation, entering instruction into programmable devices, following written and oral instruction and procedures and completing necessary documentation.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -Enter and verify operating instructions in microprocessor equipped devices as described in 8) and including: A Establishing and documenting functions that the control and drive system is required to perform B Developing and documenting circuits for the electro-pneumatic control and drive systems that meet the required functions. C Checking location of control field devices and adjusting to ensure correct functioning. D Checking electro-pneumatic control and drive system components connections E Entering functions and parameters into programmable components correctly F Correcting programming anomalies. G Testing and verifying correct operation. H Reporting work completion to appropriate persons in accordance with established procedures I Dealing with unplanned events. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI140A PLAN THE ELECTRICAL INSTALLATION OF INTEGRATED SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the planning and practices in installing an integrated systems. It encompasses working safely, applying knowledge bus system parameters, topology and installation requirements, bus system cables and terminations, control and dimming methods and planning and documenting integrated installation plans.

Required Reading: VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: -Planning and implementing integrated systems as described in 8) and including: A Establishing customer requirements for integrated system. B Determining system components and locations from job specifications and customer requirements. C Ensuring that the power source for the integrated system is suitable D Choosing integrated system component for compatibility with loads and established scenarios E Planning integrated systems to comply with bus system and supply voltage parameters F Considering other control methods in planning the integrated system G Keeping within a given budget H Documenting integrated system plan I Arranging an integrated system using an acceptable topology J

Developing a connection chart/diagram K Selecting and terminating bus cable using specified methods and polarity. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI141A DEVELOP ELECTRICAL INTEGRATED SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the development of integrated systems. It encompasses working safely, scrutinising and adapting project specifications, applying knowledge of the application for integrated systems, system topologies and devices applications and capabilities, system programming methods, using diagnostic tools and documenting the developed systems.

Required Reading:VU produced Workbooks

Assessment: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: Demonstrated consistent performance across a representative range of contexts from the prescribed items below: as described in 8) and including: A Determining the types and location of loads and control devices B Using load calculations to correctly determine the number of network and current requirements. C Placing system devices appropriately in the system scheme. D Checking programming and diagnostic tools E Applying appropriate modes of programming to develop the integrated system. F Following manufacturer's instruction and recommendations in programming devices and setting load operating parameters. G Developing integrated system to comply with regulator, safety and project requirements. H Down loading program to network successfully I Using diagnostic tools to locate and correct any system defects, faults and anomalies K Documenting and (backing up) integrated system at development at the preparation, programming and completion of the project. methods and polarity. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI142A DEVELOP AN ELECTRICAL INTEGRATED SYSTEM INTERFACE FOR ACCESS THROUGH A TOUCH SCREEN

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the development of integrated systems touch screen interface. It encompasses working safely, applying knowledge of the application integrated system, working with customers to determine required control parameters, application of touch screen software components and embellishments, network connectivity, using diagnostic tools and documenting the developed systems.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: A Determining the areas and control parameters to be accessed through the touch screen B Confirming touch screen embellishments to be applied C Down loading to a PC and checking touch screen programming and integrated system programming software and project data. D Understanding manufacturer's instruction for installing and connecting touch screens E Checking that the installation and connections for the touch screen comply with manufacture's requirements. F Developing touch screen interface functions and embellishments in accordance for compatibility with the integrated system and to customer requirements G Backing up and transferring touch screen interface program following manufacturer's instructions. H Testing touch screen and correcting non-compliance operations and anomalies. I Documenting the as-programmed touch screen specifications Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI143A DEVELOP ACCESS CONTROL OF ELECTRICAL INTEGRATED SYSTEMS USING LOGIC-BASED PROGRAMMING TOOLS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers programming functions and parameters of touch screens and other access controls in an integrated system. It encompasses working safely and to manufacturer's instructions and regulatory requirements, applying knowledge of the application integrated system, using proprietary touch screen programming tools, and documenting as-programmed assess functions.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Programming integrated system controllers using logic-based programming tools: A Determining the functions and parameters of the integrated system B Down loading a PC and checking software tools and integrated system programming software and project data. C Checking that network equipment and connectivity comply with manufacture's requirements. D Developing integrated system functions and parameters in accordance for compatibility with the integrated system and to customer requirements E Backing up and transferring programmed functions and parameters following manufacturer's instructions. F Testing access and correcting non-compliance operations and anomalies. G Documenting the as-programmed access control specifications. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI144A DEVELOP INTERFACES FOR MULTIPLE ACCESS METHODS TO MONITOR, SCHEDULE AND CONTROL AN ELECTRICAL INTEGRATED SYSTEM

Locations: Industry, Sunshine.

Prerequisites:UEENEEI142A - DEVELOP AN ELECTRICAL INTEGRATED SYSTEM INTERFACE FOR ACCESS THROUGH A TOUCH SCREEN

Description: This unit covers programming for multiple access to integrated systems for a single dwelling. Such access includes mobile phones, computer networks, remote controls, touch screens and the like. It encompasses working safely and to manufacturer's instructions and regulatory requirements, installing and setting up gateway equipment, applying knowledge of the application of integrated system including remote reprogramming and monitoring, using proprietary programming tools, and documenting as-programmed assess functions.

Required Reading: No required reading

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: A Determining extent of the various services and functions and parameters of the integrated system B Down loading a PC and checking software tools and integrated system programming software and project data. C Checking that network equipment and connectivity comply with manufacture's requirements. D Developing integrated system multiple access with manufacturer's instruction and to customer requirements. E Backing up and transferring programmed assess functions and parameters following manufacturer's instructions. F Testing multiple access and correcting non-compliance operations and anomalies. G Documenting the as-programmed access control specifications.

Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI145A DIAGNOSE AND RECTIFY FAULTS IN A.C. MOTOR DRIVE SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers diagnosing and rectifying faults in systems controlling starting, speed, torque, power output, efficient running and braking of a.c. motors. The unit encompasses safe working practices, interpreting technical data, applying knowledge of a.c motors operating parameters to logical fault finding processes, implementing fault rectification, safety and functional testing and reporting work activities and outcomes.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Diagnose and rectify faults in a.c. motor drive systems: A Applying logical diagnostic methods. B Using fault scenarios to test the cause of system faults. C Identifying faults and competency needed to rectify them. D Rectifying faults in system controls. E Verifying that the system operates correctly. F Documenting fault rectification. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI146A DIAGNOSE AND RECTIFY FAULTS IN D.C. MOTOR DRIVE SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers diagnosing and rectifying faults in systems controlling starting, speed, torque, power output, efficient running and braking of d.c. motors. The unit encompasses safe working practices, interpreting technical data, applying knowledge of d.c motors operating parameters to logical fault finding processes, implementing fault rectification, safety and functional testing and reporting work activities and outcomes.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Diagnosing and rectifying faults in d.c. motor drive systems: A Applying logical diagnostic methods. B Using fault scenarios to test the cause of system faults. C Identifying faults and competency needed to rectify them. D Rectifying faults in system controls. E Verifying that the system operates correctly. F Documenting fault rectification. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI147A DIAGNOSE AND RECTIFY FAULTS IN SERVO DRIVE SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers diagnosing and rectifying faults in systems controlling servo and drives. The unit encompasses safe working practices, interpreting technical data, applying knowledge of servo/stepper drives operating parameters to logical fault finding processes, implementing fault rectification, safety and functional testing and reporting work activities and outcomes.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Diagnose and rectify faults in servo drive systems: A Applying logical diagnostic methods. B Using fault scenarios to test the source of system faults. C Identifying faults and competency needed to rectify them. D Rectifying faults in system controls. E Verifying that the system operates correctly. F Documenting fault rectification. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI150A DEVELOP, ENTER AND VERIFY DISCRETE CONTROL PROGRAMS FOR PROGRAMMABLE CONTROLLERS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers development, installation and testing of programs for programmable controllers (PLC) for a system requiring discrete control functions. It encompasses working safely, applying knowledge of control systems, control system development methods, using ladder diagrams/statement list/function block diagram instruction sets, following written instructions and documenting program development and testing activities.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop, enter and verify programs for programmable controllers: A Developing a control system solution to the required B Identifying non-compliance conditions of device installation. C Converting control system to a PLC program. D Entering programming functions and parameters correctly. E Transferring programs to a PLC. F Correcting programming anomalies. G Testing and verify control system operation. H Transferring program to external storage. I Documenting control system and programming clearly. J Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEI151A DEVELOP, ENTER AND VERIFY WORD AND ANALOGUE CONTROL PROGRAMS FOR PROGRAMMABLE LOGIC CONTROLLERS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers development, installation and testing of programs for an industrial system requiring advance control functions. It encompasses working safely, using structure logic, acceptable design techniques, applying knowledge of high level instructions, and documenting development and programming activities.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Developing, entering and verifying programs for industrial control systems using instructions: A Developing a control system to the required operating functions and parameters. B Identifying non-compliance conditions of device installation. C Entering programming functions and parameters correctly. D Correcting programming anomalies. E Testing and verify device operation. F Documenting control system and programming clearly. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI152A DEVELOP, ENTER AND VERIFY PROGRAMS IN SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers development, installation and testing of programs for supervisory control and data acquisition. It encompasses working safely, process analysis, developing process condition database and Human-Machine Interface (HMI) using SCADA software package and documenting programming activities.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Developing, entering and verifying programs in Supervisory Control and Data Acquisition systems: A Collecting and analysing data accurately. B Converting data to an appropriate database. C Creating appropriate graphic objects. D Adding graphic objects to a library. E Developing effective HMI. F Programming SCADA functions and data acquisition components correctly. G Producing a report by the SCADA system H Correcting programming faults and anomalies. I Configuring user access rights. J Documenting SCADA system and programming clearly. K Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI153A DESIGN AND CONFIGURE HUMAN-MACHINE INTERFACE (HMI) NETWORKS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers monitoring and maintaining the operation of distributive and central control system networks. It encompasses safe working practices, installing and configuring controllers and devices, monitoring system operations, diagnosing malfunctions and faults and documenting development activities.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design and configure Human-Machine Interface networks: A Establishing network services to be developed. B Installing and configuring network infrastructure components. C Installing and configuring structural components of directory services. D Configuring management components of network services. E Creating security components of network services. F Identifying and rectifying network malfunctions. G Developing solutions to optimise network performance. H Documenting network services development activities. I Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI154A DESIGN AND USE ADVANCED PROGRAMMING TOOLS PC NETWORKS AND HMI INTERFACING

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design of computer application for control processes. It encompasses apply knowledge of control devices, control systems, programmable logic controllers, supervisory control and data acquisition systems and control programming methods, developing alternative design schemes based on design brief, customer relations and documenting designs.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design a PLC computer based control system: A Develop and test PLC code using advanced programming tools B Program and test a continuous control loop (such as PID) using a PLC. C Configure and test a PLC network enabling data to be shared between PLC's. D Configure and test a field bus style network (remote I/O) E Configure a HMI using software applicable to the PLC available. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI155A DEVELOP STRUCTURED PROGRAMS TO CONTROL EXTERNAL DEVICES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers programming of microprocessor/microcontroller devices to access external devices. The unit encompasses working safely, applying knowledge of control applications, and analogue and digital input/output signals, programming fundamentals, writing and testing program and documenting programming activities.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - developing structured programs to control external devices: A Using key features of an appropriate programming language. B Developing testing procedures. C Identifying problem and bugs in program. D Rectifying problem and bugs in program. E Writing and presenting relevant documentation to an acceptable standard. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI156A DEVELOP AND TEST CODE FOR MICROCONTROLLER DEVICES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers structured programming instructions for micro devices at a fundamental level. The unit encompasses working safely, applying knowledge device architecture and programming fundamentals, writing and testing specified instructions and documenting development activities.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop and test code for microcontroller devices: A Using all key features of an appropriate assembler language. B Developing testing procedures. C Identifying problem and bugs in program. D Rectifying problem and bugs in program. E Writing and presenting work reports to an acceptable standard. F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEI157A CONFIGURE AND MAINTAIN INDUSTRIAL CONTROL SYSTEM NETWORKS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers installing, configuring and maintaining communication service on a control network. It encompasses safe working practices, applying knowledge of industrial control network topology and protocols, configuring data links, bus monitoring and system management and access, network testing and documenting system settings.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Configure and maintain industrial control system networks: A Establishing industrial control system and network requirements and operating system versions and updates. B Installing, upgrading and configuring control application network components correctly. C Configuring access to control data and resources for each user. D Identifying network malfunctions. E Rectifying network malfunctions. F Documenting network configuration and maintenance activities. G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. .

UEENEEK024B ASSEMBLE AND SET UP PHOTOVOLTAIC APPARATUS IN DOMESTIC DWELLINGS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers installing of photovoltaic apparatus in domestic dwellings. It encompasses safe working practices; secure placement and connection of apparatus, following written and oral instruction and procedures and customer relations.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEK025B SOLVE BASIC PROBLEMS IN PHOTOVOLTAIC ENERGY APPARATUS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers providing known solutions to predictable problems in photovoltaic energy apparatus operated at extralow voltage. It encompasses working safely, problem solving procedures, including the use of basic voltage, current and resistance measuring devices, providing known solutions to predictable circuit problems.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEK025C SOLVE BASIC PROBLEMS IN PHOTOVOLTAIC ENERGY APPARATUS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers providing known solutions to predictable problems in photovoltaic energy apparatus operated at extralow voltage. It encompasses working safely, problem solving procedures, including the use of basic voltage, current and resistance measuring devices, providing known solutions to predictable circuit problems.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEK026B INSTALL AND SET UP GRID CONNECTED PHOTOVOLTAIC POWER SYSTEMS

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers the installation, adjustment and set-up of photovoltaic power systems and connecting to a supply grid inverter. It encompasses working safely and to installation standards, matching components with that specified for a given location, placing and securing system components accurately, making required circuit connections and completing the necessary installation documentation.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEK032B DEVELOP STRATEGIES TO ADDRESS SUSTAINABILITY ISSUES

Locations: Footscray Nicholson, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing strategies to address greenhouse gases and sustainability issues. It encompasses working safely, apply extensive knowledge of sustainable energy systems and components and their operating parameters, gathering and analysing data, applying problem solving techniques, developing and documenting alternatives solutions.

Required Reading: -

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview;

on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

UEENEEK042A PARTICIPATE IN ENVIRONMENTALLY SUSTAINABLE WORK PRACTICES

Locations: Footscray Nicholson, Melton, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit requires the worker to undertake methods of work practice that minimises energy and material usage and to seek energy reduction strategies in the workplace. The unit seeks to minimise negative impacts on the environment.

Required Reading:- Online resources

Assessment: Assessment methods will: - satisfy the endorsed Assessment Guidelines of the Electrotechnology Training Package - reinforce that Competency is performed with inherent safe working practices expected in the Industry to which this unit applies. - include that the specified essential knowledge and associated skills are assessed in a structured environment which is primarily intended for learning/assessment and incorporates all necessary equipment and facilities for learners to develop and demonstrate the essential knowledge and skills described in this unit. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEK125A SOLVE BASIC PROBLEMS IN PHOTOVOLTAIC ENERGY APPARATUS AND SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers providing known solutions to predictable problems in photovoltaic energy apparatus and systems operated at ELV and LV. It encompasses working safely, problem solving procedures, including the use of basic voltage, current and resistance measuring devices, providing known solutions to predictable circuit problems.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Solve basic problems in photovoltaic energy apparatus and systems: A Understanding the nature of the problem B Using established routines to solve apparatus problems C Providing viable solutions to apparatus problems. D Documenting justification for the solutions used E Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEK132A DEVELOP ENERGY SECTOR STRATEGIES TO ADDRESS ENVIRONMENTAL AND SUSTAINABILITY ISSUES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing strategies to address environmental and sustainability issues in the energy sector. It encompasses working safely, apply extensive knowledge of sustainable energy systems and components and their operating parameters, gathering and analysing data, applying problem solving techniques, developing and documenting alternatives solutions.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit must be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop strategies to address environmental and sustainability issues: A Understanding the extent of the energy problem B Forming effective strategies for solution development and implementation C Obtaining energy system/component parameters, specifications and performance requirements appropriate to each problem D Testing solutions to energy problems E Documenting instruction for implementation of solutions that incorporate risk control measure to be followed F Documenting justification of solutions implemented in accordance with professional standards G Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Assessments may include: - work projects - demonstration - written & verbal tasks. Specific unit assessments are located in the learning & assessment plans within the School.

UEENEEK133A DESIGN HYBRID RENEWABLE POWER SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design of hybrid renewable power systems and their installation. It encompasses following design briefs, incorporating schemes for protection of persons and property from dangers of system malfunction, ensuring other safety and performance standards and functional requirements are meet and documenting design calculations and criteria.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design hybrid renewable power systems as described in 8) and including: A Developing outlines of alternative designs B Developing the design within the safety and functional requirements and budget limitations C Documenting and presenting design effectively D Successfully negotiating design alteration requests E Obtaining approval for final design F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEK135A DESIGN GRID CONNECTED PHOTOVOLTAIC POWER SUPPLY SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design of grid connected photovoltaic power supply systems and their installation. It encompasses following design briefs, incorporating schemes for protection of persons and property from dangers of system malfunction, ensuring other safety and performance standards and functional requirements are meet and documenting design calculations and criteria

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design grid connected photovoltaic power supply systems as described in 8) and including: A Developing outlines of alternative designs B Developing the design within the safety and functional requirements and budget limitations C Documenting and presenting design effectively D Successfully negotiating design alteration requests E Obtaining approval for final design F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEK139A DESIGN STAND-ALONE RENEWABLE ENERGY (RE) SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the design of stand-alone renewable energy systems and their installation. It encompasses following design briefs, incorporating schemes for protection of persons and property from dangers of system malfunction, ensuring other safety and performance standards and functional requirements are meet and documenting design calculations and criteria.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design stand-alone renewable energy systems as described in 8) and including: A Developing outlines of alternative designs B Developing the design within the safety and functional requirements and budget limitations C Documenting and presenting design effectively D Successfully negotiating design alteration requests E Obtaining approval for final design F Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEK140A DEVELOP ENGINEERING SOLUTIONS TO RENEWABLE ENERGY (RE) PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers developing engineering solutions to resolve problems with renewable energy. It encompasses working safely, applying extensive knowledge of renewable energy systems and components and their operating parameters, gathering and analysing data, and applying problem solving techniques, developing and documenting alternatives solutions.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrate performance across a range of contexts from items: - Renewable energy problems as described in 8) and including: A Understanding renewable energy B Strategies for solution and implementation C Obtaining renewable energy system parameters, specifications and performance requirements appropriate to each problem. D Testing and solutions to renewable energy problems E Document instruction for implementation of solutions that incorporate risk control measure to be followed. F Documenting justification of solutions implemented in accordance with standards G Dealing with events by drawing on knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Assessments may include: - practical assessment - work projects - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEK146A DESIGN ENERGY MANAGEMENT CONTROLS FOR ELECTRICAL INSTALLATIONS IN BUILDINGS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This competency standard unit covers designing and developing methods to reduce the energy use without compromising occupancy standards in new buildings and structures. The unit encompasses working safely, setting up and conducting evaluation measurements, predicting energy use from plans and specifications and designing and documenting strategies to effectively reduce energy use in the completed installation. It draws on some multi-disciplinary skills.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated performance across a representative range of contexts from the prescribed items below: - Design energy management controls for electrical installations in buildings as listed in the Range statement' and including: A Determining the extent of the design B Setting up and conducting appropriate examinations and tests. C Reporting evaluation including recommendation for improving energy efficiency D Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in the holistic assessment with the above listed items Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEK151A DEVELOP EFFECTIVE ENGINEERING STRATEGIES FOR ENERGY REDUCTION IN BUILDINGS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers evaluating energy used in buildings and developing and documenting strategies/methods to effectively reduce energy use without compromising occupancy standards. It encompasses working safely, setting up and conducting evaluation measurements and evaluating energy use from measured parameters.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Develop strategies for effective energy reduction in buildings as described in 8) and including: A Determining the extent of the evaluation. B Setting up and conducting appropriate examinations and tests. C Reporting evaluation including recommendation for improving energy efficiency D Dealing with unplanned events by drawing on essential knowledge and skills to provide appropriate solutions incorporated in a holistic assessment with the above listed items Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEM052A CLASSIFY HAZARDOUS AREAS - GAS ATMOSPHERES

Locations: Industry, Sunshine.

Prerequisites:UEENEEE071B - WRITE SPECIFICATIONS FOR ELECTRICAL ENGINEERING PROJECTS

Description: This unit covers knowledge and skills to classify areas where flammable/combustible potentially explosive materials may exist. It requires the ability to gather and analyse data relative to explosion hazards, determine the extent of risk and establish and document zones. This unit is directly equivalent to the Unit 2.16 Classify hazardous areas in the Australian/New Zealand Standard AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Classify hazardous areas as described in 8) and including: A Accessing necessary information and identifying hazardous products involved in a given process, explosive properties of materials involved in a given process, and potential sources and characteristics of release of hazardous products. B Analysing data in the context of explosion risk. C Determining area delineation and documenting area classifications. D Applying relevant contingency management skills. - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School. Assessments may include: .

UEENEEM053A CLASSIFY HAZARDOUS AREAS - DUST ATMOSPHERES

Locations: Industry, Sunshine.

Prerequisites: UEENEEE071B - WRITE SPECIFICATIONS FOR ELECTRICAL ENGINEERING PROJECTS

Description: This unit covers knowledge and skills to classify areas where flammable/combustible materials may exist. It requires the ability to gather and analyse data relative to explosion hazards, determine the extent of risk and establish and document zones. This unit is directly equivalent to the Unit 2.16 Classify hazardous areas in the Australian/New Zealand Standard AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Classify hazardous areas as described in 8) and including: A Accessing necessary information and identifying hazardous products involved in a given process, explosive properties of materials involved in a given process, and potential sources and characteristics of release of hazardous products. B Analysing data in the context of explosion risk. C Determining area delineation and documenting area classifications. D Applying relevant contingency management skills. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEM057A DESIGN EXPLOSION-PROTECTED ELECTRICAL SYSTEMS AND INSTALLATIONS - GAS ATMOSPHERES

Locations: Industry, Sunshine.

Prerequisites: UEENEEE015B - DEVELOP DESIGN BRIEFS FOR ELECTROTECHNOLOGY PROJECTS

Description: This unit covers the explosion-protection aspects of designing electrical power, control and instrumentation systems and installations. It requires the ability to establish design briefs and to pursue economical and effective design solutions. This unit is directly equivalent to the Unit 2.18 Design explosion-protected electrical systems and installations in the Australian/New Zealand Standard AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design explosion-protected electrical systems as described in 8) and including: A Accessing and interpreting relevant information. B Providing design options and justifications including hazard risk, functionality and economic considerations. C Following checking and documentation procedures. D Applying relevant contingency management skills. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEM058A DESIGN EXPLOSION-PROTECTED ELECTRICAL SYSTEMS AND INSTALLATIONS - DUST ATMOSPHERES

Locations: Industry, Sunshine.

Prerequisites: UEENEEE015B - DEVELOP DESIGN BRIEFS FOR ELECTROTECHNOLOGY PROJECTS

Description: This unit covers the explosion-protection aspects of designing electrical power, control and instrumentation systems and installations. It requires the ability to establish design briefs and to pursue economical and effective design solutions. This unit is directly equivalent to the Unit 2.18 Design explosion-protected electrical systems and installations in the Australian/New Zealand Standard AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: - Design explosion-protected electrical systems as described in 8) and including: A Accessing and interpreting relevant information. B Providing design options and justifications including hazard risk, functionality and economic considerations. C Following checking and documentation procedures. D Applying relevant contingency management skills. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEM059A DESIGN EXPLOSION-PROTECTED ELECTRICAL SYSTEMS AND INSTALLATIONS - PRESSURISATION

Locations: Industry, Sunshine.

Prerequisites: UEENEEE015B - DEVELOP DESIGN BRIEFS FOR ELECTROTECHNOLOGY PROJECTS

Description: This unit covers the explosion-protection aspects of designing electrical power, control and instrumentation systems and installations. It requires the ability to establish design briefs and to pursue economical and effective design solutions. This unit is directly equivalent to the Unit 2.18 Design explosion-protected electrical systems and installations in the Australian/New Zealand Standard AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Required Reading: VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: ? Design explosion-protected electrical systems as described in 8) and including: A Accessing and interpreting relevant information. B Providing design options and justifications including hazard risk, functionality and economic considerations. C Following checking and documentation procedures. D Applying relevant contingency management skills. Assessments may include: -

practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEM068A ASSESS THE FITNESS-FOR-PURPOSE OF HAZARDOUS AREAS EXPLOSION-PROTECTED EQUIPMENT - GAS ATMOSPHERES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This Competency Standard Unit covers the explosion-protection aspects of overhauling and repairing explosion-protected equipment at a craftsperson level. It requires the ability to identify and select authorized components, follow repair specifications to effect the overhauled/repaired of equipment and complete repair documentation. This unit is directly equivalent to the Unit 2.20 Carry out overhaul and repair of explosion-protected equipment in the Australian/New Zealand Standard AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrate performance across a representative range of contexts from the prescribed items below:as described in 8) and including: A Follow OHS. B Authenticating equipment specification documentation. C Obtaining Standards and codes. D Carry out measurements/tests accurately and safety. E Design specification that reflects the function of the equipment or system. F Assessing equipment/system for compliance. G Identify difference between design details and Standards. H Decisions on the viability of remedial work I Developing clear specifications for acceptable remedial work. J Writing a fitness-for-purpose report that includes all required elements. K Applying contingency management skills. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEM075A DESIGN EXPLOSION-PROTECTED ELECTRICAL SYSTEMS - COAL MINING

Locations: Industry, Sunshine.

Prerequisites:UEENEEE015B - DEVELOP DESIGN BRIEFS FOR ELECTROTECHNOLOGY PROJECTS

Description: This unit covers the explosion-protection aspects of designing electrical power, control and instrumentation systems and installations. It requires the ability to establish design briefs and to pursue economical and effective design solutions. This unit is directly equivalent to the Unit 2.18 Design explosion-protected electrical systems and installations in the Australian/New Zealand Standard AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: ? Design explosion-protected electrical systems as described in 8) and including: A Accessing and interpreting relevant information. B Providing design options and justifications including hazard risk, functionality and economic considerations. C Following checking and documentation procedures D Applying relevant contingency management skills. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

UEENEEM079A DESIGN OF GAS DETECTION SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the selection aspects of gas detection equipment for the design of gas detection systems and installations for hazardous areas. It requires the ability to establish equipment parameters and to evaluate these against manufacturer specifications. This unit is directly equivalent to the Unit 2.19 Design gas detection systems and installations in the Australian/New Zealand Standard AS/NZS 4761.1 Competencies for working with electrical equipment for hazardous areas (EEHA) Part 1: Competency Standards. Equivalence includes endorsement in the explosion-protection techniques listed in the Range statement of this unit.

Required Reading:VU produced Workbooks

Assessment: Evidence for competence in this unit shall be considered holistically. Demonstrated consistent performance across a representative range of contexts from the prescribed items below: ? Design gas detection systems as described in 8) and including: A Accessing and interpreting gas detection needs and parameters. B Providing selection options based on parameters for gas detection and economic considerations. C Following checking and documentation procedures. D Applying relevant contingency management skills. Assessments may include: - practical assessment - work projects - demonstration - written and verbal tasks. Specific unit assessments are located in the learning and assessment plans within the School.

VAA125 ADVANCED ENGINEERING MATHS A

Locations: Sunshine.

Prerequisites: Nil.

Description:ADVANCED ENGINEERING MATHS A

Required Reading: No Required Reading

VAA126 ADVANCED ENGINEERING MATHS B

Locations: Sunshine.

Prerequisites: Nil.

Description:ADVANCED ENGINEERING MATHS B

Required Reading: No Required Reading

VAA2002 ELECTRICAL POWER SYSTEMS 1

Locations: Footscray Park.

Prerequisites:ENF1202 - ENGINEERING PHYSICS 2

Description: This unit is taught in two distinct parts by separate academic and sessional academic staff. Part A - Electrical Circuits. Provides students with a sound knowledge of elementary electrical circuits and introduces students to various circuit analysis methods. Operating principles and performance characteristics of motors and generators will be introduced in addition to three-phase circuits and their analysis. An overview of electrical transformers will be given. Part B - Power Distribution. Overview of power generation and distribution in Australia. The role of a specialist electrical services system design engineer. Regulations, standards and codes of practice. High, medium and low voltage distribution practices. An introduction to the range of transformers used in power distribution systems. System 'fault' capacity and calculation. Cable properties and cable selection based on current, temperature, voltage drop and fault levels. An introduction to switchboard design and construction.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply the Node-Voltage and Mesh-Current methods to the solution of linear DC circuit analysis;
- Apply the Principle of Superposition to circuit analysis, and be aware of those circuits where it is not applicable;
- Locate the Thevenin and Norton equivalents of complex circuits;
- Describe the concepts of frequency, impedance and admittance and to be able to analyse linear AC circuits;
- Describe three phase electric circuits and analyse balanced three phase systems;
- Describe a single-phase transformer, its equivalent circuit model, as well as transformer performance calculations;
- Describe the operating principles of motors and generators, understand their equivalent circuit models, and calculate the operating and performance characteristics (power, torque, efficiency, power factor, and etc.) of these machines using their equivalent circuit models;
- Describe the role of a specialist building electrical services system design engineer;
- Identify regulations, standards and codes of practice used in the building industry for electrical installations;
- Calculate building electrical system fault levels;
- Select electrical power cables based on current, temperature, voltage drop and fault levels.

Class Contact: Sixty (60) hours for one semester comprising of lectures, tutorials, and laboratory work.
Required Reading: Wildi, T. 2005, 6th Edition, Electrical Machines, Drives and Power Systems, New Jersey: Prentice Hall. Australian Standards AS 3000, AS 30088, and AS 3439.1.
Assessment: Laboratory Work, Part A: Two Laboratory Group Reports (Team of four, 1000 words each), 25%. Project, Part B: Project Group Report (Team of four, 2000 words), 25%. Examination, 3 Hour Examination to Cover Parts A and B., 50%. Laboratory Work: Learning Outcomes 5,6, and 7 and Graduate Capabilities 1,2,3,4, and 5. Project: Learning Outcomes 9,10,11 and Graduate Capabilities 1,2,4 and 6. Examination: Learning Outcomes 1-11, and Graduate Capabilities 1,2,4 and 6. .

VAA2031 ARCHITECTURAL HISTORY & DESIGN

Locations: Footscray Park.
Prerequisites: Nil.
Description: Architects are recognised as the primary Design Professionals in the Building Industry. This subject acquaints students with insight into the Architectural process by discovering the historical evolution of buildings technically and aesthetically and how they relate to the culture and time in which they were built. A selection of design skills are explored to promote conceptual thinking and visual communication. Group workshops are used to promote research and problem solving techniques as well as basic three dimensional visualisation through model making.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to have gained: 1. An appreciation of the historical evolution of Architecture and Building; 2. Skills in visual communication through freehand drawing techniques; 3. An appreciation of basic architectural design skills, both technical and conceptual; 4. An awareness of designing in consideration of environmental conditions; 5. An awareness of the Architectural design process and have developed an understanding and a vocabulary to relate to and communicate with other professionals.
Class Contact: Sixty (60) hours for one semester comprising of a mix of group activities, lectures, site work and workshops.
Required Reading: Nil.
Assessment: Individual portfolios and reports which provide evidence demonstrating that the learning outcomes for the subject have been achieved. The assessment material will include three major section as listed below that demonstrate an appreciation of Architecture in History, skills in abstract thinking and visual communication and skills in three dimensional 'spatial' problem solving and model making. Report, History of Architecture, 30%. Portfolio, Architecture Design Theory, 30%. Portfolio, Architectural Workshop, 40%.

VAA2082 BUILDING CONSTRUCTION AND CONTROL 1

Locations: Footscray Park.
Prerequisites:VAC2011 - ENGINEERING MATERIALS & CONSTRUCTIONVAA2031 - ARCHITECTURAL HISTORY & DESIGN
Description: This unit of study aims to give students an understanding of the various forms of building construction and building technology, and an understanding of the standards relevant to the control of buildings in general, in Australia. The focus of this subject will be domestic housing and small commercial / industrial buildings and as such will be taught in two sequential sections, the first for 'domestic housing' and the second for 'small commercial/industrial buildings'.Domestic housing Common forms of construction. Foundation conditions and earthworks. Floor systems. Damp-proofing. Wall and roof cladding. Balconies and stairways. Construction techniques and sequence of work. Thermal insulation. Lighting and ventilation. Drainage. Linings and internal finishes. Establishment of building sites. Builders' plant and equipment. Site safety. Building schematic documentation and detailing. Building regulatory systems and building codes. (Small) commercial/industrial buildings Structural frames. Load-bearing and non-load-bearing walls. Pre-caste construction. Alternative building structural systems. Building thermal, electrical, lighting and hydraulic services requirements. Emergency evacuation exits. Building maintenance. Establishment of building sites. Builders' plant and equipment. Site safety. Building schematic documentation and detailing. Building regulatory systems and building codes.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: Appreciate the fundamentals of conventional and innovative forms of construction for both domestic housing and (small) commercial industrial buildings; Communicate with other professionals in the building process using appropriate building terminology; Assess the involvement of various building trades, professions and authorities; Interpret and apply evolving building standards and statutory requirements; Identify the causes of common building problems, and devise effective treatments; 6. Formulate building schemes and details appropriate to the type of construction, and organize the planning of construction works for both domestic housing and (small) commercial industrial buildings.
Class Contact: Sixty (60) hours for one semester comprising briefings, workshops, individual work, site visits, team meetings and team work.
Required Reading: Wilkie, G, 2003, Completely revised edition, Building your own home: a comprehensive guide for owner-builders, New Holland Publishers (Australia) Pty Ltd, Sydney. Ching, FDK, 2008, Fourth edition, Building construction illustrated, John Wiley & Sons, Inc, Hoboken, New Jersey. Australian Building Codes Board (ABCB), 2010, Code of Australia (BCA) 2010 Volume One, ABCB Publications, Canberra. Australian Building Codes Board (ABCB), 2010, Building Code of Australia (BCA) 2010 Volume Two, ABCB Publications, Canberra.

Assessment: Assignment, individual tutorial exercise work and team take-home assignment work, 50%. Portfolio, individual portfolio , 50%. The portfolio is to feature work done in tutorials and at home, including graphical and written designs and specifications detailing creative building solutions appropriate to various property development scenarios, a reflective journal, and self and peer assessment.

VAA3001 ELECTRICAL POWER SYSTEMS 2

Locations: Footscray Park.

Prerequisites:VAA2002 - ELECTRICAL POWER SYSTEMS 1

Description: Circuit protection devices, power distribution system protection, configuration of low voltage distribution systems. Transformers and their specification. High voltage switchgear. Earthing of buildings. Power factor correction. Electrically hazardous areas. Lightening protection of buildings. Common electric motor types. Electric motor starting. Motor protection. Motor control circuits. Vertical transportation - an introduction. Methods of achieving reliability in building electrical power supply. Standby power generation systems. Uninterruptible power supplies (UPS). Sizing central battery systems. Battery systems for UPS's. Harmonics within power distribution systems. Electronic security systems. Exit and emergency lighting systems. Energy management in electrical power systems. Operational planning and maintenance of building power systems.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Evaluate the electrical power supply needs of residential, commercial and light industrial buildings. 2. Select and determine the size of all electrical power cables, their circuit protection and distribution control devices for a range of proposed residential, commercial and light industrial buildings. 3. Understand the process of electrical power supply to buildings and the interaction(s) applicable with power supply authorities to ensure a safe and secure supply to buildings. 4. Evaluate the range of solutions for the supply of emergency electrical power to buildings and be able to select appropriate system(s) for buildings and interface systems with the supply authority provided power to a building. 5. Determine the electrical power needs of building vertical and horizontal transportation systems, and be able to provide power as needed by these systems. 6. Appraise a range of potential problems and maintenance requirements (and their solutions) that could be experienced by a modern building electrical power distribution system. 7. Be familiar with the general 'architecture' of modern building electrical power distribution systems. 8. Have developed a deeper insight and ability to solve problems, undertake building electrical power distribution analyses and write technical reports.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and site visits.

Required Reading:J.R.Cogdell, 2003 Foundations of Electric Circuits Prentice Hall J.R.Cogdell, 2003 Foundations of Electric Power Prentice Hall Australian Standards AS3000, AS30088 and AS3439

Assessment: Examination, Final Exam, 65%. Assignment, Individual Project, 30%. Tutorial Participation, Based on class performance, 5%.

VAA3031 ENVIRONMENTALLY SUSTAINABLE DESIGN 1

Locations: Footscray Park.

Prerequisites:VAN2041 - THERMOFLUIDS

Description: This unit of study aims to give students a basic understanding, problem solving skills and design skills in the areas of sustainable design of buildings. Major topics covered include: climate change, basic principles of ecological buildings; buildings of tomorrow: examples and ideas, including natural ventilation in buildings, thermal storage, façade design for daylighting and solar energy transmission, air quality improvement; active measures of renewable energy usage, use of rainwater and organic matter.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students are expected to be able to:

- Attain an overview of theories relating to climate change and ozone layer depletion;
- Develop an understanding of the current issues in relation to energy, water, waste, materials and IEQ, especially in the context of the built environment;
- Appraise government policies at federal, state and local levels;
- Explain the role of government bodies and other organisations in promoting sustainable development;
- Recognize interactions between buildings and their surroundings;
- Explain the principles governing building design to achieve adequate levels of IEQ;
- Predict consequences of alternative design approaches that designers can take to achieve desired outcomes in relation to IEQ;
- Identify the common tools designers use to evaluate alternative approaches and their capabilities;
- Demonstrate an ability to work effectively as a member and/or leader of a team, and to time manage multiple tasks;
- Demonstrate good communication skills, based on technical reports and oral presentations.

Class Contact: Sixty (60) hours for one semester comprising of small group work, team meetings, lectures, workshops, seminars, practical work and site visits.

Required Reading: Class notes as distributed.Daniels, K., 1997 The Technology of Ecological Building Birkhauser

Assessment: For each assessment component, 50% of available marks must be achieved in order to pass the subject. Assignment, Two different assignments, 40%. Portfolio, Inclusive of ongoing work/ oral presentations, 30%. Examination, Final, 30%.

VAA3032 ENVIRONMENTALLY SUSTAINABLE DESIGN 2

Locations: Footscray Park.

Prerequisites:VAA3071 HVAC Systems 1, VAA3031 Environmentally Sustainable Design 1.

Description: This unit of study aims to give students a basic understanding, problem solving and design skills in the areas of building heat transfer and ventilation. It covers the following topics:Heat and its transmission through building structures. Convective-conductive heat flow. The U-value. Condensation in the façade cavity. Surface temperatures and thermal comfort. Glazing systems. Single and double skin facades. Wind pressures. Natural ventilation. Thermal modelling using computer packages. Steady-state one-dimensional conduction in building-elements. Discretised form of the continuous form of the governing equation and its solution. Convergence of solutions. Steady-state conduction in composite materials - analytical and numerical solutions. Estimation of heat flows into building enclosures. Numerical determination of transient heat transfer in two-dimensional systems. Studies of heat transfer by convection in fluids.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Show an understanding of the fundamental principles of heat transfer in buildings. 2. Demonstrate the ability to locate and effectively interpret information/data relevant to these areas. 3. Identify, formulate and solve related problems, and carry out associated mathematical analyses. 4. Evaluate solutions against technical, environmental, economic and social criteria. 5. Demonstrate good communication skills, based on technical reports and oral presentations.

Class Contact: Sixty (60) hours for one semester comprising of small group and individual work, team meetings, lectures, workshops, seminars and reading assignments. In addition, students are expected to devote at least the same amount of time for private and/or group study.

Required Reading: Kreider, J.F., Curtiss, P.S. and Rabl, A., 2002 Heating and Cooling in Buildings McGraw Hill

Assessment: Report, Report on thermal conductivity of building elements such as walls, roofs, floors and how they are used in buildings, 4%. Report, Report on solar geometry as a prelude to calculating temperatures on the surfaces of buildings, 4%. Report, Report on calculating the effect of solar loads on building surfaces and the effects of glazing, 4%. Report, Report on calculating heating and cooling loads on a daily cycle at any geographical location at any time of day, 4%. Report, Final report that integrates all of the aspects of the design of a low energy beach house, 24%. Presentation, Production of poster and oral presentation, 30%. Examination, Three (3) hour skills audit on the main topics of the unit, 30%.

VAA3042 HYDRAULIC SERVICES SYSTEMS

Locations: Footscray Park.

Prerequisites:VAC2042 - HYDRAULICS

Description: This unit of study aims to give students a basic understanding, problem solving and design skills in the areas of building water supply, sanitary plumbing and stormwater management. It covers the following topics. Types and components of building water supply systems. Assessment of demands and flows. Design criteria, head losses in pipes and fittings. Analysis and design of hot and cold pipework systems. Pumps-pump and pipeline selection. Pressure systems. Selection and arrangement of mains pressure commercial hot water units to supply to hot water fixture outlets. Theory and design of roof drainage, storm water systems and sewer drainage systems including materials, fixtures and fittings, and the general requirements for fully vented and modified, single stack and modified sewage plumbing systems, all for building sites, residential and multi storied commercial buildings. Introduction to wastewater treatment processes and building water harvesting/recycling systems.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an understanding of key issues and design principles involved in hydraulic services systems in buildings; 2. Locate and effectively use information / data relevant to these areas; 3. Identify, formulate and solve related problems, and to carry out associated design work; 4. Evaluate solutions against technical, environmental, economic and social criteria; 5. Work effectively as a member and/or leader of a team; 6. Demonstrate good communication skills, based on technical reports and/or oral presentations.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorials.

Required Reading: Ng, A. et al (20**) Building Hydraulic Services Class Notes, Sem 2. Victoria University Australian Standards 3500 (2003) National Plumbing and Drainage Code Parts 0-4 Australian Standards (VU; 20** indicates current year edition)

Assessment: Examination, Final, 60%. Assignment, Semester, 40%.

VAA3071 HVAC SYSTEMS 1

Locations: Footscray Park.

Prerequisites:VAN2041 - THERMOFLUIDSVAC2042 - HYDRAULICS

Description: Module1: Refrigeration What is air conditioning? The concept of enthalpy. Reverse Carnot cycle. Vapour compression and absorption cycles. Refrigeration systems and components. COP. Refrigerants. Air conditioning and the environment.Module 2: Psychrometry Thermodynamic properties of air and water. Psychrometry and psychrometric processes. Psychrometric chart and its uses. Thermal comfort.Module 3: Load estimation Basic mechanisms of heat transfer. Heat transfer through composite walls. Heating load estimation. Solar heat gains. Room and system heat gains/losses. Cooling load estimation. Program Camel. Energy conservation in buildings.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply principles of thermodynamics to explain how refrigeration and air conditioning systems work; 2. Explain basic psychrometric processes and show how they apply in various types of air conditioning systems; 3. Categorise the components of cooling and heating loads in buildings, and carry out cooling and heating load estimation; 4. Explain the impact of air conditioning systems on the environment and suggest ways of minimising it.

Class Contact: Sixty (60) hours for one semester comprising of lectures and tutorials.

Required Reading: Paks, M., 1997 Design of Building Air Conditioning Systems, Part 1: Psychrometry AS&TP Jones, WP, 2001 Air Conditioning Engineering Butterworth Heinemann AIRAH, 1997 Air Conditioning: Load Estimation AIRAH Murray, M., Hamilton, T. and Kingston, T., 2002 User Guide for the Computer Program Camel ACADS-BSG Notes provided by the lecturer Class notes on WebCTBlackboard

Assessment: For each assessment component, 50% of available marks must be achieved in order to pass the subject. Assignment, Two assignments, 65%. Examination, End-of-semester, 35%.

VAA3072 HVAC SYSTEMS 2

Locations: Footscray Park.

Prerequisites:VAA3071 - HVAC SYSTEMS 1

Description: Module 4: Air and water systems in buildings. Flow of fluids in pipes and ducts. Open and closed water systems in buildings. Design of condenser, chilled and hot water systems. Demand-based water systems. Domestic cold and hot water system design. Measurement of flow and pressure in building water and air systems. Pressure distribution and cavitation. Fan and pump selection. Design of ducted systems. Fan laws and applications. Types of air conditioning systems. Constant and variable volume systems.Module 5: System components and selection. Air handling plant. Thermal plant. Methods of heat rejection. Packaged and built-up air handling units. System design for full-load and part-load operation. Energy efficiency in equipment selection and operation. Duct and pipe configurations to accommodate controls requirements. Multiple unit installations. Smoke management systems.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Explain the principles and operation of air and water systems in buildings; 2. Compare alternative configurations applicable to duct and pump design in order to minimise pressure losses; 3. Carry out an estimate of duct and pipe pressure losses applicable to building HVAC systems, and select an appropriate fan or pump; 4. Assess options available to HVAC designers in selecting main types of plant; 5. Explain an impact of design decisions on equipment performance under full-load and part-load operation, and on system energy efficiency.

Class Contact: Sixty (60) hours for one semester comprising of lectures and tutorials.

Required Reading: Paks, M., 1995 An Introduction to the Design of Building Air Conditioning Systems AS&TP Standards Australia, 1998-2002 Australian Standards

AS1668 Pt. 1, 2 and 3 Wang, SK., 2001 2nd ed. Handbook of Air Conditioning and Refrigeration McGraw Hill

Assessment: For each assessment component, 50% of available marks must be achieved in order to pass the subject. Assignment, Two assignments, 65%. Examination, End-of-semester, 35%.

VAA3081 BUILDING CONSTRUCTION AND LEGISLATION 1

Locations: Footscray Park.

Prerequisites:VAA2031 Architectural History and Design

Description: This unit of study aims to give students an understanding of various forms of construction and applicable standards relevant to building generally: Common forms of construction. Foundation conditions and earthworks. Formwork. Floors in single-storey and low-rise buildings. Structural frames. Load-bearing and non-load-bearing walls. Tilt-up construction. Wall and roof cladding. Balconies and stairways. Lighting and ventilation. Exits. Lining and internal finishes. Services requirements. Damp-proofing. Thermal insulation. Drainage. Alternative structural systems. Builders' plant and equipment. Use of explosives in construction. Recycling, rehabilitation and renovation of buildings. Building maintenance. Concept of intelligent buildings. Establishment of building sites. Site safety. Workmanship. Building regulatory systems and building codes. Building schematic documentation and detailing. Specifications and standards. Construction techniques and sequence of work.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students will have demonstrated:

- an understanding of the fundamentals of conventional and innovative forms of construction.
- familiarity with building terminology.
- an appreciation of the involvement of various building trades, professions, and authorities.
- knowledge in relation to building standards and statutory requirements.
- an understanding of the causes and treatment of common building problems.
- skills in the formulation of building schemes and details and the planning of construction work.

Class Contact: This unit will be delivered in PBL mode, and will comprise 60 hours (5 hours equivalent per week) of sessions made up of small group work, team meetings, lectures, workshops, seminars, practical work and site visits. In addition, students are expected to devote at least the same amount of time for private and/or group study. The unit is worth 12 credit points.

Required Reading: Australian Building Codes Board (ABCB) (2005), Building Code of Australia (BCA) 2005 Volume Two, CanPrint Communications Pty Ltd; Class Notes

Assessment: Based 100% on an individual portfolio which documents evidence that the learning outcomes have been achieved. The portfolio may include skills audit results, assignment / project reports including graphical and written designs and specifications detailing creative building solutions appropriate to various property development applications, a reflective journal, workbook(s), and self and peer assessment. Further details on portfolio components will be issued to students during the first week of classes.

VAA3181 BUILDING CONSTRUCTION AND CONTROL 2

Locations: Footscray Park.

Prerequisites:VAA2082 - BUILDING CONSTRUCTION AND CONTROL 1

Description: This unit aims to give students an understanding of the specialist forms of construction and complex statutory controls that are relevant to: Multi-unit residential development and high-rise commercial buildings. Medium-density residential development. Common structural forms employed eg. column and beam construction, reinforced flat slabs, post-tensioned floors and their formwork systems. Spandrel walls and curtain walls. Heavy and light weight building façade systems. Structural/services cores. Spread footings, beam and pile footings. Basements and their water-proofing. Ground support systems. Protection of adjoining property during excavation and construction. Selection of building cranes and hoists for construction. Construction temporary scaffolding. Construction sequence applicable to high-rise buildings. Temporary site services and amenities. Occupational health and safety codes of practice for construction. Fire protection during construction. Schematic documentation and detailing specific to high-rise building. Design and construction standards and statutory requirements. Specification writing and contracts applicable to these types of building works. Examples of best professional practice in Building Construction and Control of multi-unit residential development and high-rise commercial buildings.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Appreciate the fundamentals of conventional and innovative forms of construction for multi-unit residential and high-rise commercial buildings.; Appreciate the nature of building construction in heavily-developed urban environments; Appraise the common structural features and services installations specific to tall buildings; Assess the involvement of principal consultants and contractors; Develop further and apply their knowledge of urban development and building regulatory procedures, codes and standards; Assume a leadership role in space and amenity planning;
7. Identify major plant and equipment, techniques and practices typically employed in high-rise construction work.

Class Contact: Sixty (60) hours for one semester comprising briefings, workshops, individual work, site visits, team meetings and team work.

Required Reading: State of Victoria Department of Sustainability and Environment, 2004, Guidelines for higher density residential development, Victorian Government Department of Sustainability and Environment, East Melbourne. Ching, FDK, Onoye, BS, Zuberbuhler, D, 2009, Building structures illustrated: patterns, systems, and design, John Wiley & Sons, Inc, Hoboken, New Jersey. Australian Building Codes Board (ABCB), 2010, Building Code of Australia (BCA) 2010 Volume One, ABCB Publications, Canberra. Australian Building Codes Board (ABCB), 2010, Building Code of Australia (BCA) 2010 Volume Two, ABCB Publications, Canberra.

Assessment: Assignment, individual tutorial work and team take-home assignment work, 50%. Portfolio, Individual Portfolio, 50%. The portfolio is to feature work done in the tutorials and at home, including graphical and written designs and specifications detailing creative solutions appropriate to building types and/or property development scenarios, a reflective journal, and a self and peer assessment.

VAA4001 ARCHITECTURAL LIGHTING AND COMMUNICATIONS SYSTEMS

Locations: Footscray Park.

Prerequisites:VAA3001 - ELECTRICAL POWER SYSTEMS 2

Description: This subject consists of two distinct themes, the first is Architectural Lighting of buildings, the second is Building Communications systems. They are taught in parallel by different academic (and sessional academic) staff. Part A Light, and the visible portion of the electro-magnetic spectrum. Visual performance characteristics of the human eye. Photometric concepts and units of measurement. Direct and indirect surface illuminance calculations. Electric lamp technology, including incandescence, gaseous/vapour discharges. Principles of colourimetry. The

CIE classification system/colour rendering indices. User 'quality' assessment of illuminated spaces including control of glare. Daylight as an alternative to electric light. CIE and other models of sky luminance as a means to simple daylight estimation. Surveys of existing building illumination systems and practical (actual) illumination of buildings using a range commercial luminaires and lamps. Part B Theory of voice and data telecommunications systems. Communication mediums. Signal properties. Transmission and reception system characteristics. Protocols and systems architecture. Building telecommunication system 'architecture'. Emergency warning and inter-communications systems. Security, closed circuit television, fire alarm communications. Elevator communication systems. Integration of all systems in a building. System testing and maintenance. Specifications/tender interpretation for communications system acquisition.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Evaluate the artificial lighting needs of residential, commercial and industrial buildings in accordance with Australian standards, current 'best practice'' and the minimization of electrical energy usage; 2. Select and determine the size of luminaries, lamps, their control devices for a range of residential, commercial and industrial buildings. Predict illumination levels at relevant positions from installed lighting systems, using manual and computer calculation methods; 3. Recommend suitable maintenance programs for artificial lighting systems to achieve required illumination levels throughout the life of the lamps employed in the system; 4. Estimate the contribution that natural daylight can provide to the interior illumination of buildings, through the architecture of the building fabric and façade; 5. Appreciate the range of commercial solutions and equipment for building data and voice communications systems, and be able to distinguish the applicability of alternate systems for a given building; 6. Select appropriate forms of specification (for tendering) for the installation of building data and voice communications systems; 7. Develop a deeper insight and ability to solve problems and write technical reports.

Class Contact: Part A Thirty six (36) hours for one semester comprising lectures, tutorials and practical classes. Part B Twenty four (24) hours for one semester comprising lectures and tutorial classes.

Required Reading:AS 1680 (2002) Code for Interior Lighting Australian Standard Helms R. and Belcher M. Clay. (2005) Lighting for Energy Efficient Luminous Environments AS 3080; AS 4428; AS60849; AS2201 Australian Standards BCA (2008) Building Code of Australia

Assessment: Other, Examinations, assignments, portfolio and class work, 100%. Part A Examination: Stage test - Lighting principles - 18% Assignment 1: Domestic lighting survey - 6% Assignment 2: Computer simulation - 6% Portfolio: Practical lighting (Industry) - 30% Part B Examination: Final exam - 20% Assignment 1: Individual project - 10% Assignment 2: Individual project - 6% Class involvement: Class interaction - 4% .

VAA4032 ENVIRONMENTALLY SUSTAINABLE DESIGN 3

Locations: Footscray Park.

Prerequisites:VAA3032 - ENVIRONMENTALLY SUSTAINABLE DESIGN 2VAA4001 - ARCHITECTURAL LIGHTING AND COMMUNICATIONS SYSTEMSVAA3071 - HVAC SYSTEMS 1VAA3072 - HVAC SYSTEMS 2

Description: Introduction to building performance analysis tools (software as used by architects and engineers in compliance with energy efficiency provisions of the Building Code of Australia). Computer simulation modelling of buildings including thermal and solar performance, natural ventilation, natural and artificial lighting and computational fluid dynamics (CFD). Analysis of alternative design scenarios to optimise the thermal and lighting performance of buildings.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Model and simulate complex integrated building designs in the area of thermal performance, natural ventilation, air conditioning, solar penetration, thermal comfort, and natural/artificial lighting; 2. Analyse alternative building design scenarios to achieve optimised building thermal and lighting performance.

Class Contact: Sixty (60) hours or equivalent for one semester comprising of a mix of small group work, lectures, workshops and site visits.

Required Reading: Szokolay, S.V. (2008) 2nd Edition uction to Architectural Science: the Architectural Press, Oxford, UK

Assessment: Portfolio, Portfolio, 100%. An individual portfolio which provides documented evidence demonstrating that the learning outcomes for the subject have been achieved. The portfolio will include two major parts: a skills audit and an assignment set which focuses on an existing building (nominally the student's residence). The assignment set includes benchmarking, simulation and exploration of a series of possible renovations. The skills audit is conducted in a series of standardized tasks comprising a short course in Building Thermal Performance Assessment (Residential) that can result in a Statement of Attainment if performance is at least 80% on each in-class skills audit.

VAA4042 BUILDING FIRE SAFETY SYSTEMS

Locations: Footscray Park.

Prerequisites:VAA3042 - HYDRAULIC SERVICES SYSTEMSVAA3181

Description: This unit aims to give students an introduction to building fire safety engineering (FSE). Includes, fire safety and protection provisions in building regulations and building codes. deemed-to-satisfy design, design to standards, and performance based design. Stakeholders in the FSE design process. Fire design briefs, design, certification, fires safety system commissioning, and maintenance. Performance methods of design including equivalence, absolute evaluation of performance requirements, use of qualitative and quantitative methods, scientific (phenomenological) and risk approaches. Fire initiation and development, smoke control, fire spread, detection, warning, suppression, evacuation, and fire brigade intervention. Pre-flashover fire growth. Smoke spread. Post-flashover fire modelling. Occupant response in fires. Active sprinkler protection systems and ancillary equipment. Classes of hazard, design criteria and code requirements. System requirements for Ordinary Hazard (OH) systems. Full hydraulic calculation method for design of OH systems. Assumed area of operation. Design density of discharge. Design of fire hydrant and fire hose reel systems. Residential and domestic sprinkler systems. Portable fire extinguishers. Fire risk statistics, event and fault trees, and overall fire risk management.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Appreciate the fundamentals of fire safety engineering in building design; 2. Participate in the fire safety design process using correct fire safety terminology; 3. Assess the involvement of fire safety authorities and the need for specialist fire safety consultants and contractors; 4. Interpret and apply existing fire safety standards and related statutory requirements in an 'evolving' area of the building industry. Appraise the applicability of research and fire safety standards from overseas, to Australian conditions; 5. Specify fire safety features and installations appropriate to various sizes / uses of a range of residential, light industrial and commercial buildings; 6. Formulate fire safety schemes and details, and organize the planning of system installation and maintenance.

Class Contact: Sixty (60) hours for one semester comprising briefings, workshops, individual work, site visits, team meetings and team work.

Required Reading: Buchanan, AH, 2001 Fire Engineering Design Guide ntre for Advanced Engineering, University of Canterbury Australian Building Codes Board (ABCB), 2010 Volume One Building Code of Australia (BCA) 2010 Australian Building Codes Board (ABCB), Canberra

Assessment: Other, individual tutorial work and team take-home assignment work, 50%. Portfolio, Portfolio, 50%. The portfolio is to feature work done in tutorials and at home, including a graphical and written record of fire safety system design(s), specifications detailing creative solutions appropriate to the given building design brief, a reflective journal, and a self and peer assessment.

VAA4051 BUILDING QUANTITIES AND COSTS

Locations: Footscray Park.

Prerequisites:VAN3052 Engineering Management.

Description: The project development process, the parties and the trades involved in the process. Bill of Quantities. Quantity surveyor's role. Introduction to schedule of rates of the bill of quantities and components, measurements of quantities. Estimating principal trades, contractors' cost estimates and standard method of measurement. Computer applications for estimating process. The feasibility of construction projects. Life cycle costing (LCC) analysis, theory of LCC optimization, practical application of LCC to engineering projects. Project cash flows, budgeting and cost control. Cost control during project development and construction phase. Value engineering. Building maintenance and associated costs.

Credit Points:6

Class Contact:two hrs of lectures and 1hr of tutorial and computer lab session per week

Required Reading: Lecture Notes; Marsden, Paul K. (1998) Basic Building Measurement, 2nd Edition, New South Wales University Press, Sydney, Australia; Kirk & Dell'Isolla (1999) Life Cycle Costing for Design Professionals, 2nd Edition

Assessment: Assignment 1: based on weeks 1-5 (calculations, sketches, computer applications, max word limit of 1000), 15%; Assignment 2: based on weeks 6-11 (calculations, sketches, computer applications, max word limit of 1000), 15%; Class Tutorial Exercises Based on Weeks 1-11 (calculations, sketches, computer applications, max word limit of 500),10%; three hour examination, 60%.

VAA4071 HVAC SYSTEMS 3

Locations: Footscray Park.

Prerequisites:VAA3072 HVAC Systems 2.

Description: Module 6: Operation of controls in building services systems. Fundamentals of controls theory. Sensors and their responses. Operation of dampers and control valves. Control strategies applicable to air conditioning systems and equipment. Direct digital controls. Energy management in air conditioning. Module 7: Fundamentals of sound. Noise criteria and assessment. Sound in rooms. Sound insulation. Noise sources in buildings: fans and fan systems. Noise control in ducts.

Credit Points:6

Class Contact:three hrs of lectures per week.

Required Reading: Bies, D. and Hansen, C., 2003, Engineering Noise Control: Theory and Practice, 3rd ed., E & FN Spon, London; Coffin, MJ., 1998, Direct Digital Control for Building HVAC Systems, 2nd ed., Kluwer Academic Publishers; Notes provided by the lecturers; Class notes.

Assessment: Assignment 1: (Group assignment; up to 3000 words), 30%; Assignment 2: (Group assignment; up to 3000 words + calculations + diagrams, 35%; three hour examination, 35%.

VAA4082 BUILDING CONSTRUCTION AND LEGISLATION 2

Locations: Footscray Park.

Prerequisites: Nil.

Description: Column-and-beam construction. Fire-resistance of structural members. Structural/services cores, suspended slabs and associated formwork systems. Construction sequence applicable to high-rise buildings. Spandrel walls and curtain walls. Atriums. Fire-isolated stairways. Basements and damp-proofing. Ground support systems. Protection of adjoining property. Exterior finishes. Partitioning. Artificial lighting and mechanical ventilation. Emergency lighting and exit signs. Sanitary facilities. Access and facilities for people with disabilities. Lifts and escalators. Essential services for fire safety. Temporary site services and amenities. Occupational health and safety codes of practice. Use of cranes and hoists. Scaffolding. Temporary overhead protection. Fire protection during construction. Demolition work. Schematic documentation and detailing specific to high-rise building. Design and construction standards and statutory requirements. Medium-density residential development.

Credit Points:6

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to:

- developed an understanding of the nature of building construction in heavily-developed urban environments;
- become familiar with structural features and services installations specific to tall buildings;
- gained an appreciation of the involvement of principal consultants and contractors;
- enhanced their knowledge of urban development and building regulatory procedures, codes and standards;
- become more skilled in space and amenity planning; and
- gained an appreciation of major plant and equipment, techniques and practices typically employed in high-rise construction work.

Class Contact: This unit will be delivered in PBL mode, and will comprise 36 hours (3 hours equivalent per week) of sessions made up of small group work, team meetings, lectures, workshops, seminars, practical work and site visits. In addition, students are expected to devote at least the same amount of time for private and/or group study. The unit is worth 6 credit points.

Required Reading: Australian Building Codes Board (ABCB) (2005), Building Code of Australia (BCA) 2005 Volume One, CanPrint Communications Pty Ltd; Burnell, R., VAA4082 Class Notes

Assessment: Based 100% on an individual portfolio which documents evidence that the learning outcomes have been achieved. The portfolio may include skills audit results, assignment / project reports including technical calculations, site visit reports, a reflective journal, workbook(s), and self and peer assessment. Further details on portfolio components will be issued to students during the first week of classes

VAA4091 STRUCTURAL DYNAMICS 1

Locations: Footscray Park.

Prerequisites:RMA 1002 Engineering Mathematics 1B & REP 1003 Engineering Physics 1C.

Description: Introduction to structural vibrations. Degree of freedom of a system - vibrations of undamped and damped systems, harmonically excited vibration of systems, response systems to harmonically forced excitation, general forcing functions. Eigenvalue for a system, determination of natural frequencies and mode

shapes, structural vibration simulation using computer software.
Credit Points:6
Class Contact:two hrs of lectures and one hrs of tutorials per week
Required Reading: Rao S.S. (1995), Mechanical Vibrations, Third Ed., Addison-Wesley Publishing Company; Inman D.J. (2001) Engineering Vibration, Second Ed., Prentice Hall; Class Notes.
Assessment: Computer based assignment (3000 words equiv.), 25%; Mid-semester test (1 hr), 15%; Tutorial presentation (15 mins), 5%; three hour examination, 60%.

VAA4092 BUILDING SYSTEMS DESIGN AND CONSTRUCTION

Locations: Footscray Park.
Prerequisites:VAA3072 HVAC Systems 2 or VAC3092 Structural Design
Description: This unit aims to provide students with an overview of key concepts involved in the integration of building services with building structure, during the design and construction stages. Students are exposed, through a range of lectures and site visits, to constructability/buildability and co-ordination aspects of building services, as well as to compliance with building codes and regulations. Issues involving integrated building design to minimise construction costs and achieve sustainable construction methods are also introduced.
Credit Points:6

Learning Outcomes: On successful completion of this unit,it is expected that students will be able to:

- be able to understand problems and procedures involved in co-ordination of individual building services.
- be able to understand principles of successful integration of all building services during the design and construction stages.
- be able to conceptualise solutions to construction technology tasks and problems, logistical planning and assembly.
- have enhanced their report writing and oral presentation skills.

Class Contact: This unit will be delivered in PBL mode, and will comprise 36 hours (3 hours equivalent per week) of sessions made up of small group work, team meetings, lectures, workshops, seminars, practical work and site visits. In addition, students are expected to devote at least the same amount of time for private and/or group study. The unit is worth 6 credit points.
Required Reading: Paks, M. et al, VAA4092 Class Notes.
Assessment: Based 100% on an individual portfolio which documents evidence that the learning outcomes have been achieved. The portfolio may include skills audit results, assignment / project reports including technical calculations, site visit reports, a reflective journal, workbook(s), and self and peer assessment. Further details on portfolio components will be issued to students during the first week of classes

VAA4121 STRUCTURAL DYNAMICS

Locations: Footscray Park.
Prerequisites:VAC3021 - STRUCTURAL ANALYSISVAC3092 - STRUCTURAL DESIGN
Description: This unit of study aims to provide an insight into the analysis and design of structures subject to dynamic loads. The following topics would be covered: Degrees of freedom, undamped and damped systems, response of systems to harmonic excitations, general forcing functions. Eigen value for a system, natural frequencies and mode shapes. Introduction to earthquake resistant design, response spectra, seismic behaviour of structures, basis of seismic design codes. Introduction to blast and impact forces. Response of multi degree of freedom systems.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Analyse the response behaviour of systems subjected to harmonic excitations and general forcing functions; 2. Calculate natural frequencies of systems and draw or develop mode shapes; 3. Develop response spectra of single degree of freedom systems; 4. Use earthquake codes of practice; 5. Use commercially available software in the analysis and/or design of structures subjected to dynamics loads; 6. Interpret data collected from the instrumentation of structures under natural vibration and or forced excitation.
Class Contact: Sixty (60) hours for one semester comprising a mixture of lectures, tutorials, workshops, site visits (including inquiry based laboratory sessions) and group activities.
Required Reading: Class Notes and additional resources on WebCT
Assessment: Examination, Closed book examination, 40%. Portfolio, Inclusive of 2 or 3 projects, 60%. The portfolio provides documented evidence demonstrating that the learning outcomes for the subject have been achieved. The portfolio may include reports based on laboratory activities, site visits, software applications and/or other assigned tasks. .

VAA4171 HVAC SYSTEMS 3

Locations: Footscray Park.
Prerequisites:VAA3072 - HVAC SYSTEMS 2
Description: Module 6: Operation of controls in building services systems. Fundamentals of controls theory. Sensors and their responses. Operation of dampers and control valves. Control strategies applicable to air conditioning systems and equipment. Direct digital controls. Energy management in air conditioning. Module 7: Fundamentals of sound. Noise criteria and assessment. Sound in rooms. Sound insulation. Noise sources in buildings: fans and fan systems. Noise control in ducts.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe processes and key issues relating to the control of heating, ventilation and air-conditioning (HVAC) systems; 2. Solve a range of acoustics problems in the built environment and to apply the science of acoustics in HVAC systems design; 3. Apply skills in the following generic areas: application of basic science and engineering principles in HVAC systems, control or noise problem identification, formulation and solution; 4. Demonstrate a systems approach to diagnosing control and acoustic problems within complex HVAC systems
Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and site visits.
Required Reading: Notes provided by the lecturers; Class notes. Bies, D. and Hansen, C., 2003, 3rd ed., Engineering Noise Control: Theory and Practice, E & FN Spon, London Coffin, MJ., 1998, 2nd ed., Direct Digital Control for Building HVAC Systems, Kluwer Academic Publishers; Szokolay., 2004, Introduction to Architectural Science: The basis of sustainable design. Elsevier Publishing, Oxford.
Assessment: Assignment, Control Systems, 35%. Assignment, Acoustics, 35%. Examination, Final, 30%.

VAA4182 BUILDING SYSTEMS DESIGN & COSTING

Locations: Footscray Park.
Prerequisites:VAN3052 - ENGINEERING MANAGEMENTVAC3192 - STRUCTURAL ENGINEERING DESIGN 1
Description: Module 1: Building Systems Design This module aims to provide students having background in building services or in structural design with an overview of the main issues involved in the integration of these elements, during the design and construction stages. It intends to develop in the student a systematic, analytical and

critical approach to the constructability issues and explains how buildability can be implemented within the procurement process. Students are exposed, through a range of lectures and site visits, to buildability and coordination aspects of building services, as well as to compliance with building codes and regulations. It further aims to develop students' ability to think laterally in order to select the most suitable option during the design stage resulting in services and structural system integration, aiming to minimise construction costs and impact on the environment. Module Two: Costs The project development process, the parties and the trades bill of quantities; quantity surveyor's role; schedule of rates; measurements of quantities; estimating principal trades, contractors' cost estimates; computer applications for estimating process; construction projects feasability; life cycle costing (LCC) analysis, theory of LCC optimization, LCC application in engineering projects; project cash flows, budgeting and cost contro; cost control in development and construction phases; value engineerin; building maintenance.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Identify problems and procedures involved in co-ordination of individual building services; 2. Assess principles of successful integration of all building services into building structure during the design and construction stages; 3. Conceptualise solutions to problems involving construction technology tasks, logistical planning and assembly; 4. Describe the methodology applied in the measurement and estimating of building works, including computer applications; 5. Describe the roles of bills of quantities and the pricing of unit rates in the tendering process; 6. Discuss the role of cost control frameworks in the design and construction phases of capital works; 7. Explain the principles and methodology for life cycle economic evaluation and management of building-related assets; 8. Apply appropriate software for estimating and life cycle cost modelling; 9. Develop advanced report-writing and oral presentation skills.

Class Contact: Sixty (60) hours or equivalent for one semester comprising of a mix of lectures, small group work and workshops.

Required Reading: Marsden, Paul K. (1998) 2nd Edition Basic Building Measurement New South Wales University Press, Sydney, Australia Kirk & Dell'Isolla (1999) 2nd Edition Life Cycle Costing for Design Professionals Notes and handouts provided by the lecturers.

Assessment: For each assessment component, 50% of available marks must be achieved in order to pass the subject. Assignment, Integrated building design, 35%. Assignment, Estimating and life cycle cost analysis, 30%. Presentation, Oral presentation, 5%. Examination, End-of-semester examination, 30%.

VAC2011 ENGINEERING MATERIALS & CONSTRUCTION

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit covers the behaviour, properties, performance and limitations of the most widely used construction materials such as concrete, steel, timber as well as other construction materials such as polymers and composites. In addition, the unit gives an introduction to construction equipments, techniques and OH&S requirements used by the Civil or Building Engineering industry .

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Identify the types, properties and applicability of materials; most commonly used in civil and building engineering construction work (i.e. concrete, steel and timber). Demonstrate an appropriate knowledge of other construction and building materials masonry, aluminium, glass, polymers and composites. Select the types and applications of plants, equipments and construction processes for variety of civil and building engineering construction processes. Investigate materials, equipment and construction techniques for a specific project. Describe the importance of the OH&S and environmental requirements for working in a construction site with specific material, plant or project.

Class Contact: Sixty (60) hours for one semester comprising a mixture of lectures, PBL workshops (including inquiry based laboratory sessions) and, group activities.

Required Reading: Students will be provided with class notes and additional resources online, in line with the topics. There is no required text for this unit.

Assessment: Examination, End of semester 2 Hour Exam, 50%. Project, PBL1: Group technical report with 2000 words approximately, 25%. Case Study, PBL2: Group technical report with 2000 words approximately, 25%. Examination covers all Learning Outcomes and Graduate Capabilities 1, 2 & 3 Project covers Learning Outcome 1, 2 & 5 and all Graduate Capabilities and the 50% LiWC Case study covers Learning Outcomes 3, 4 & 5 and all Graduate Capabilities.

VAC2022 BUILDING MATERIALS AND CONSTRUCTION

Locations: Footscray Park.

Prerequisites: Nil.

Description: Sand and crushed rock: excavation, drilling, blasting, conveyance, crushing, screening, washing, storage, use. Concrete: constituents, mix design, laboratory tests and standards for strength, workability, etc (cylinders, slump), properties of fresh and hardened concrete (strength, serviceability, creep, shrinkage, durability), concrete plant arrangements, concrete transport, placing, reinforcement, curing, pumping, spraying, cement grouting. Formwork for concrete. Steel: types and applications, material standards, fabrication, paints / coatings and corrosion protection, delivery and erection. Timber: strength and serviceability properties, effects of microstructure and moisture content (hardwoods, softwoods, grain, gum, chemical constituents, etc), decay / weathering and protection, typical applications, fire resistance. Other materials: overview of properties and applications of masonry, aluminium, glass and selected plastics. Introduction to construction equipment/ techniques including use of excavators, dredges, shoring, pumping and dewatering plant, piledrivers, scaffolding and falsework, winches, cranes, cableways and haulage units. Construction sites: site establishment and facilities required, introduction to OH&S issues. Many of the topics above will be related to case studies on projects such as buildings, bridges, roads, tunnels and dams.

Credit Points:12

Learning Outcomes: Upon successful completion of this subject, students will be able to demonstrate

- a broad understanding of the types, properties and applicability of materials most commonly used in civil and building engineering construction work.
- a broad knowledge of the type, properties and applications of plant and equipment which could typically be used in a variety of civil and building engineering construction processes.
- a broad knowledge of construction techniques which could be used in a variety of projects.
- an ability to make a reasonable choice of materials, plant, equipment and construction techniques for one or more specific projects.
- an ability, within the context of the subject areas above, to find and use relevant information, to formulate and solve specific problems, to work both autonomously and as a member of a team.

Class Contact:5 hrs equivalent per week of sessions made up of small group work, team meetings, workshops, seminars, laboratory sessions and site visits. In addition, students are expected to devote at least this much time for private and/or group study.

Required Reading: None Required

Assessment: An individual portfolio which providesevidence that demonstrates that the learning outcomes have been achieved. The portfolio may include skills audits, laboratory reports, site visit / project reports, reflective journals, workbooks, self and peer assessment.

VAC2032 CIVIL PROJECT

Locations: Footscray Park.

Prerequisites:VAC2011 - ENGINEERING MATERIALS & CONSTRUCTIONvac2171

Description: This unit aims (i) to develop students' ability to apply skills learned in other year 1 and 2 units to (one or more of) the investigation, planning, design, construction and costing of facilities which might be of benefit to groups within the community, and (ii) to further develop a range of more generic skills including teamwork and communication. Students will work in small teams on projects generally derived from local councils, community groups, schools, companies or government agencies. Projects might typically relate to water conservation, parkland / school / playground development, OH&S issues, small scale construction works and the like, and develop further skills / knowledge in such areas as surveying, mapping and drawing, hydraulics, materials and basic construction, and roadwork elements. Output will typically consist of one or more reports including problem analysis, calculations, engineering drawings and recommendations, and an oral presentation on the project.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Investigate, plan, design and/or construct elements of a relatively simple but real civil engineering project; 2. Identify, formulate and solve specific design problems associated with the project; 3. Locate and effectively use information / data relevant to the project; 4. Reasonably consider technical, environmental, economic and social issues relevant to the project; 5. Work effectively as a member and/or leader of a team; 6. Demonstrate good communication skills, based on technical reports, team discussions and an oral presentation.

Class Contact: Sixty (60) hours for one semester comprising sessions made up of design workshop / seminars and student team investigation, design and/or construction work.

Required Reading: Jensen, J.N. (2006), A User's Guide to Engineering, Pearson Prentice Hall

Assessment: Portfolio, Portfolio, 100%. The portfolio documents evidence that the learning outcomes have been achieved. The portfolio will normally include skills audit results and design reports including technical calculations, but may also include a reflective journal, workbook(s), and self and peer assessment. Further details on portfolio components will be issued to students during the first week of classes.

VAC2042 HYDRAULICS

Locations: Footscray Park.

Prerequisites:VAN2041 - THERMOFLUIDS

Description: Fluid resistance and boundary layers; Development of pipe friction equations and their use. Fluid flow through pipelines; inter-reservoir- pipeline flow, branching pipelines, parallel pipelines; Dimensional analysis – Rayleigh's method and Buckingham pi method, hydraulic models and similarity; Pumps - positive displacement and rotodynamic systems. Pump performance equations, affinity laws and specific speed. Pump selection for particular duties; Flow in open channels - fundamentals (continuity, energy and momentum equations), discharge equations, specific energy and critical depth relationships, flow transitions and weirs and flumes. Gradually varied flow and water surface profiles. Introduction to unsteady flow condition.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Identify concepts of hydraulics, complemented with practical laboratory based experiments (on pipe flow and open channel flow); 2. Apply continuity, momentum and energy equations to inter-reservoir pipe flow; 3. Use dimensional analysis to develop relationships and also for hydraulic model similitude studies; 4. Identify types of pumps, affinity laws and pump selection for particular duty; 5. Apply concepts of open channel flow to practical engineering related problems.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and laboratory sessions.

Required Reading: Hamill, L. (2001) 2nd edition Understanding Hydraulics MacMillan Press Class notes uploaded on WebCT

Assessment: Assignment, Based on self selected site visit in week 9 (Report, photographs, sketches, max word limit of 1500), 10%. Test, Three (3) tests throughout semester, 30%. Examination, End-of-semester examination, 60%.

VAC2071 SURVEYING

Locations: Footscray Park.

Prerequisites: Nil.

Description: Surveying Reference and Basic Computations, Mapping, Vertical Measurement and Note Keeping, Angular Measurement and Note Keeping, Circular Curves, Contours and Contouring, Area Computations for Polygons, Rectangular co-ordinates, Computations for Earth Works, Digital Terrain Models, Geographic Positioning Systems, Victorian Land Title System.

Credit Points:12

Required Reading: Class notes.

Assessment: Field work/tutorials 1: Basic Survey Computations (Max. 500 words), 5%; Field work/tutorials 2: Mapping (Max. 500 words), 5%; Field work/tutorials 3: Transferring a level to determine RL of a point (Max. 500 words), 5%; Field work/tutorials 4: Level traverse to determine RL of many points (Max. 500 words), 5%; Field work/tutorials 5: Determining angles in horizontal plane (Max. 500 words),5%; Field work/tutorials 6: Circular curve set out (Max. 500 words), 5%; Field work/tutorials 7: Grid leveling and contouring (Max. 500 words), 5%; Field work/tutorials 8: Area and perimeter computations using co-ordinates (Max. 500 words), 5%; two hour examination, 60%; Students are required to pass both Field Work and Examination to receive a pass in the subject.

VAC2072 HIGHWAY ENGINEERING

Locations: Footscray Park.

Prerequisites:VAC2171 - ENGINEERING SURVEYING

Description: Earthworks including equipment, determination of quantities and costs; preparation and use of mass haul diagrams. Route location factors, route selection, horizontal alignment including circular curves and transition curves and superelevation, determination of sight distance; vertical alignment including grades and vertical curves. Pavement design methods for both flexible and rigid pavements, determination of number of equivalent standard axles, use of California Bearing Ratio. Road construction equipment capabilities. Introduction to road drainage methods, surface and subsurface drainage. Road maintenance issues and programs.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply appropriate geometric standards to the design of rural roads;
- Demonstrate understanding of methods to determine efficient earthworks operations;
- Demonstrate understanding of the process for designing road pavements;
- Identify, formulate and solve related problems, and carry out associated design work;
- Use a system approach to design, and evaluate solutions against technical, environmental, economic and social criteria;
- Work effectively as a member and/or leader of a team;
- Demonstrate good communication skills, based on technical reports and team discussion and/or oral presentations.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and one field trip.
Required Reading: Austroads (1993), 7th edn; Rural Road Design Austroads Evans, G. (20**), VAC2072 Highway Engineering Notes, sem 2, 20** Victoria University (VU; 20** indicates current year addition)
Assessment: Assignment, Assignment 1: site investigations, 10%. Assignment, Assignment 2: geometric standards and super elevation (calculations & drawings), 10%. Assignment, Assignment 3: pavement design (calculation & drawings), 10%. Examination, Final, 70%.

VAC2092 INTRODUCTION TO STRUCTURAL ENGINEERING DESIGN

Locations: Footscray Park.
Prerequisites:VAC2121 - SOLID MECHANICS
Description: This unit of study aims to provide a basic introduction into the design principles of structural elements. The following topics would be covered: Steel: Load calculation, dead and live loads, design loads rationale, calculation of specific loads. Design of simple structural members in tension, compression, bending and shear. Design of bolted and welded connections in simple shear or tension.Timber: Design of timber beams, columns. Nailed and bolted connections in simple shear.Other materials: Review of fundamental concepts based on Solid Mechanics.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: Design steel elements in tension, compression, bending and shear; Design steel connections consistent with the above outcome; Design timber beams and columns and appropriate connection details; Demonstrate a basic understanding of design fundamentals; 5. Formulate and solve specific problems, and work both autonomously and as a member of a team;
Class Contact: Sixty (60) hours for one semester comprising a mixture of lectures, tutorials, workshops, site visits (including inquiry based laboratory sessions) and group activities.
Required Reading: Class Notes and additional resources on WebCT
Assessment: Portfolio, Portfolio, 100%. The portfolio provides documented evidence demonstrating that the learning outcomes for the subject have been achieved. The portfolio may include skills audits, laboratory activities, project reports, reflective journals, self and peer assessment.

VAC2121 SOLID MECHANICS

Locations: Footscray Park.
Prerequisites:ENF1102 - ENGINEERING PHYSICS 1ENF1201 - ENGINEERING MATHEMATICS 2
Description: Engineers are required to design or analyse a variety of elements, components or structures that are often exposed to a variety of loading conditions. Therefore an abstract understanding of statics, equilibrium and the mechanics of materials used is required. In particular, the abstract concepts of the equivalent states of equilibrium and the compatibility of external and internal deformation must be understood. It is widely recognised that “Statics” and “Solid Mechanics” is a fundamental subject area in engineering.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Evaluate states of statical equilibrium for objects subjected to forces/couples in two/three dimensions, including external 'freebody' force/couple diagrams;
- Assess internal forces in simple pin-jointed trusses, beams and frames including axial force, bending moment and shearing force diagrams;
- Determine elastic normal and shearing stresses in objects subjected to force systems;
- Evaluate properties of cross-sections(including centroids and moment of inertia) and stiffness and strength properties of engineering materials;
- Evaluate deflection of simple beams, failure modes of simple compression members, and internal/external forces in simple two dimensional rigid frames;
- Solve problems, undertake basic Engineering analysis and design and write technical reports.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorial/practice classes. Includes a mix of individual and small group work.
Required Reading: Hibbeler, RC 2010, 12th edn in SI units, Engineering mechanics: statics, Pearson/ Prentice Hall, Singapore. Recommended Reading - Texts Hibbeler, RC 2004, "Statics and mechanics of materials", SI Units, Pearson/ Prentice Hall, Singapore. Hibbeler, RC 2011, "Mechanics of materials", 8th edn in SI Units, Pearson/ Prentice Hall, Singapore
Assessment: Test, Mid Semester Test (1.5 hours), 20%. Examination, End of Semester Examination (3 hours), 50%. Assignment, Homework Problems (fortnightly), 15%. Project, Project Report (10 pages approx.), 15%. Assessment Item 1 addresses graduates capabilities 1 and 2; and learning outcomes 1, 2, and 6. Assessment Item 2 addresses graduates capabilities 1 and 2; and learning outcomes 2 to 6. Assessment Item 3 addresses graduates capabilities 1,2 and 5; and learning outcomes 1 to 6. Assessment Item 4 addresses graduates capabilities 3,4 and 5; and learning outcome 6. .

VAC2171 ENGINEERING SURVEYING

Locations: Footscray Park.
Prerequisites:ENF1201 - ENGINEERING MATHEMATICS 2
Description: This unit of study covers the application of a range of surveying instruments and the techniques to be adopted. The following topics would be covered: Surveying reference and basic computations, Mapping, Vertical measurement and note keeping, Angular measurement and note keeping, Circular curves, Contours and Contouring, Area computations for polygons, Rectangular co-ordinates, Computations for earth works, Digital terrain models, Geographic positioning systems and Victorian land title system.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Use a range of surveying instruments; Observe measurements in the field and keep records; Set out circular curves; Produce contour maps of different terrains; Operate with rectangular co-ordinates and compute areas of polygonal shapes;

6. Formulate and solve specific problems and work both autonomously and as a member of a team.

Class Contact: Sixty (60) hours for one semester comprising a mixture of lectures, tutorials, field work and group activities.

Required Reading: Class Notes and additional resources on WebCT.Ghilani, C D & Wolf, P R. (2011) 13th Ed. Elementary Surveying: An Introduction to Geomatics New York: Pearson Education

Assessment: Practicum, Fieldwork (6 practicals at max two pages each), 30%. Assignment, One assignment (1000 words), 20%. Examination, 2 hour end of semester exam, 50%. LiWC component is the fieldwork reports valued at 30% Fieldwork components assess Graduate capabilities 1 to 5 and Learning Outcomes 1 to 6 Assignments assess Graduate Capabilities 3 to 6 and Learning Outcomes 2,4,& 6 Exam assesses all Graduate Capabilities and Learning Outcomes.

VAC3021 STRUCTURAL ANALYSIS

Locations: Footscray Park.

Prerequisites:VAC2121 Solid Mechanics

Description: Engineers are required to design or analyse a variety of structures that are often exposed to a variety of loading conditions. Therefore an understanding of key analysis methods for statically determinate and indeterminate trusses, beams and frames should be mastered. These include, the method of virtual work for determination of deflections and rotations, the 'stiffness' method of analysis (including the equations of slope deflection and numerical approximation by moment distribution) for beams and rigid frames, the matrix representation of the stiffness method for solution by digital computation and the flexibility method of analysis for statically indeterminate trusses, beams and rigid frames. Experience in approximate analysis of structures and in structural 'modelling' and analysis using commercial linear finite element analysis computer program(s). An introduction to stability analyses of rigid frames and frame buckling.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Evaluate structural deflections and rotations for a range of structures (modelled as connected linear elements), which behave in a linear and elastic manner; 2. Evaluate internal axial forces, shearing forces and bending moments for a range of determinate and indeterminate structures (modelled as connected linear elements), which behave in a linear and elastic manner; 3. Create and analyse structure models using a commercial computer program, where structures are modelled as connected linear elements which behave in a linear and elastic manner; 4. Create and analyse structure models using a commercial computer program, where structures are modelled as connected linear elements within which, at ultimate load, compression members may buckle; 5. Compare solutions obtained by analysing structures using commercial computer programs to those obtained by classical (manual) methods of analysis, and to understand the limitations of both approaches to structural analysis. 6. Appraise a range of approximate solutions for common structures; 7. Solve problems, undertake standard structural Engineering analyses and write technical reports.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorials.

Required Reading: Hibbler R.C., 2005 6th edition Structural Analysis Pearson International

Assessment: Examination, Mid-semester test, 30%. Examination, Final Exam, 35%. Assignment, Portfolio of computer analyses, 20%. Assignment, Structural model project, 15%.

VAC3031 CIVIL ENGINEERING DESIGN 1

Locations: Footscray Park.

Prerequisites:VAC2072 - HIGHWAY ENGINEERINGVAC2042 - HYDRAULICS

Description: This unit of study aims to give students design skills in several areas of civil engineering, and to further develop a range of more generic skills including teamwork and communication. Students will work in small design teams to carry out (typically) four designs drawn mainly from the areas of water and road engineering. Each design will involve analysis, calculations and preparation of engineering drawings. Two designs will have associated with them an individual writing task of about 800 words on aspects relating to the design. Students must also prepare and deliver one oral presentation on one of the designs or associated written tasks performed during the semester.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students are expected to be able to: 1. Respond to a range of simple civil engineering design problems; 2. Perform preliminary designs in a number of civil engineering disciplines; 3. Evaluate design solutions against a range of technical and other criteria; 4. Demonstrate problem identification / formulation / solution, effective communication, an ability to work as a member and/or leader of a small team, the ability to use a system approach to design, and a capacity to undertake life-long learning.

Class Contact: Sixty (60) hours for one semester comprising sessions made up of design workshop / seminars and student team design work.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Portfolio, The portfolio will normally include skills audit results and design reports including technical calculations,, 100%. The portfolio may also include a reflective journal, workbook(s), and self and peer assessment. Further details on portfolio components will be issued to students during the first week of classes.

VAC3041 HYDROLOGY AND WATER RESOURCES

Locations: Footscray Park.

Prerequisites:VAC2042 - HYDRAULICS

Description: This unit of study aims to give students basic understanding of several key hydrologic and hydraulic concepts and their application in the management of water resources. It covers the following topics. Hydrologic cycle. Measurement of precipitation. Streamgauging. Hydrologic statistics. Rainfall frequency analysis. Design rainfalls. IFD curves. Statistical rational formula. Flood frequency analysis. Unit hydrographs. Urban drainage system analysis and design (system layout; hydrology and hydraulics). Urban stormwater drainage computer software. Reservoir routing. River routing. Runoff routing. RORB computer software. Culvert hydraulics and design. Retarding basin design. Floodplain management. Structural/non-structural measures for flood damage mitigation. Introduction to water supply systems. Reservoir design by critical period methods and simulation. REALM computer software. Streamflow analysis. Introduction to stochastic streamflow data generation. River basin planning. Engineering economic analysis for water resources projects, Drought analysis and management. Water sharing principles. Environmental flows.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students are expected to be able to: 1. Apply basic principles of hydraulics and hydrology in a range of water-related projects; 2. Indicate the importance of social objectives, environmental

issues and sustainability concepts in various catchment management and water engineering design projects; 3. Evaluate solutions against technical, environmental, economic and social criteria; 4. Work effectively as a member and/or leader of a team, and to time manage multiple tasks; 5. Apply good communication skills, based on technical reports and oral presentations.
Class Contact: Sixty (60) hours for one semester comprising small group work, team meetings, lectures, workshops, seminars, practical work and site visits.
Required Reading: Linsley, R.K. et al. (1992) Fourth Ed. Water Resources Engineering McGraw Hill Hamill, L. (2001) Second Ed. Understanding Hydraulics MacMillan Press Class Notes.
Assessment: Portfolio, The portfolio may include skills audit results, assignment / project reports including technical calculations, 100%. The portfolio may also include site visits and/or laboratory reports, a reflective journal, workbook(s), and self and peer assessment. Further details on portfolio components will be issued to students during the first week of classes.

VAC3042 HYDRAULIC ENGINEERING

Locations: Footscray Park.
Prerequisites:VAC2042 - HYDRAULICS
Description: This unit of study aims to give students a basic understanding, problem solving and design skills in the areas of water supply and irrigation engineering. It covers the following topics:Urban Water Supply Schemes: Demand assessment and management, supply sources, dam types/spillways/outlet works/construction and safety issues, groundwater development works, water quality requirements and various types of treatment to satisfy these, service storage, pumping stations, reticulation system arrangements/layout and manual/computer analysis, pipeline design and construction.Irrigation: Purpose and principles of irrigation, irrigation water quality, channel design and structures, flood, furrow, sprinkler and trickle irrigation layout and design principles
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate understanding of key issues and design principles involved in urban water supply / treatment systems and irrigation works; 2. Locate and effectively use information / data relevant to these areas; 3. Identify, formulate and solve related problems, and carry out associated design work; 4. Evaluate solutions against technical, environmental, economic and social criteria. 5. Work effectively as a member and/or leader of a team; 6. Demonstrate good communication skills, based on technical reports and team discussion and/or oral presentations.
Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and (usually) one field trip.
Required Reading: Lechte, P. (20**), VAC3042 Hydraulic Engineering - Course Notes and Tutorial Problems, Sem 2, 20** (VU; 20** indicates current year edition)
Assessment: In order to be eligible for either a pass or supplementary assessment, students must get at least 40% on the end-of-semester examination Test, Class Test, 10%. Assignment, Field &/or problem-based team assignment, in 2-3 parts, 30%. Examination, 3 hr end-of-semester exam, 60%. Test assesses: Graduate capability 4, Learning outcome 1 Assignment assesses: Graduate capabilities 1-5, Learning outcomes 2-5 (assignment is normally split into 2-3 parts, with total max no. of pages / student ~ 10 (may include text, diagrams, photos, calculations/computer output, etc, so straight word limit cannot be given) Examination assesses:Graduate capabilities 1-3, Learning outcomes 1-3 LIWC linked to simulated work environment & field investigation part of assignment.

VAC3061 GEOMECHANICS

Locations: Footscray Park.
Prerequisites:VAC2121
Description: Importance of geology in engineering. Earth history, rock formation and basic structural geology. Geological maps and their interpretation. Erosion/transportation/deposition processes and soil formation. Geology and soils of Melbourne and related case studies. Classification, description and engineering properties of soil and rock, soil phase relationships, clay behaviour. In-ground stress due to gravity loads, principle of effective stress. Permeability, seepage of water through soil, flow nets and applications. Shear strength, friction angle and cohesion in various soil types under differing moisture conditions, Mohr-Coulomb strength criterion. Slope failure mechanisms and related stability analyses, stability charts and methods of slope stabilisation. Earthworks and compaction of soils and crushed rock including methods, specification and field evaluation. Geotechnical site investigation including desk studies, boring/sampling/testing methods, soil/rock profile logging and reporting.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate understanding of processes and key issues related to the areas of geology, soil and rock classification systems and water behaviour, water seepage through soils, soil shear strength, slope stability, compaction and geotechnical site investigations; 2. Locate and effectively use information / data relevant to these areas; 3. Solve a range of numerical problems and carry out design tasks related to these areas; 4. Work effectively as a member and/or leader of a team; 5. Demonstrate good communication skills, based on technical reports and team discussion.
Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and laboratory work
Required Reading: Smith, I, (2006) 8th edn Elements of Soil Mechanics Blackwell Science Lechte, P. (20**) VAC3061 Geomechanics - Supplementary Notes and Tutorial Sheets, Sem 1, 20** Victoria University (VU; 20** indicates current year edition)
Assessment: In order to be eligible for either a pass or supplementary assessment, students must get at least 40% on the end-of-semester examination Test, Class test, 10%. Assignment, Field & problem-based team assignment, in 2-3 parts, 30%. Examination, 3 hour end-of-semester exam, 60%. Test assesses: Graduate capability 4, Learning outcome 1 Examination assesses: Graduate capabilities 1-3, Learning outcomes 1-3 Assignment assesses: Graduate capabilities 1-5, Learning outcomes 2-5 (assignment is normally split into 2-3 parts, with total max no. of pages / student ~ 9-10 (these may include text, diagrams, photos, calculations, graphs, etc, so straight word limit can't be given) LIWC linked to field investigation part of assignment.

VAC3062 GEOTECHNICAL ENGINEERING

Locations: Footscray Park.
Prerequisites:VAC3061 - GEOMECHANICS
Description: Introduction to foundation design. Bearing capacity of shallow pad and strip foundations on fine and coarse-grained soils. In-ground stress distribution due to applied loads. Foundations on reactive soils. Pile foundations including types and loading conditions. Load capacity of single driven and bored piles, and of pile groups. Immediate settlement. Consolidation theory and consolidation settlement of foundations on fine-grained soils. Settlement rates and allowable settlement. Lateral stresses in the ground. Active and passive stress states. Analysis and design of gravity, cantilever, propped and anchored retaining walls. Intro to structural design of foundations and construction issues including ground stabilisation and dewatering. Types and uses of geosynthetic materials. Identification and remediation of contaminated soils.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate understanding of key issues related to analysis and design of both shallow and deep foundations and earth retaining structures, foundation construction, geosynthetic materials, and contaminated soil identification / remediation; 2. Locate and effectively use information / data relevant to these areas; 3. Identify and/or solve a range of related problems and carry out associated design tasks; 4. Work effectively as a member and/or leader of a team; 5. Demonstrate good communication skills, based on technical reports and team discussion.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorials.

Required Reading: Smith, I. (2006) 8th edn, Elements of Soil Mechanics, Blackwell Science Lechte, P. (20**), VAC3062 Geotechnical Engineering - Supplementary Notes and Tutorial Problems, Sem 2, 20** Victoria University (VU; 20** indicates current year edition)

Assessment: In order to be eligible for either a pass or supplementary assessment, students must get at least 40% on the end-of-semester examination Test, Class test, 10%. Assignment, Field & problem-based team assignment in 2-3 parts, 30%. Examination, 3 hr end-of-semester exam, 60%. Test assesses: Graduate capability 4, Learning outcome 1 Assignment assesses: Graduate capabilities 1-5, Learning outcomes 2-5 (assignment is normally split into 2-3 parts, with total max no. of pages / student ~ 10 (these may include text, diagrams/plans, photos, calculations, computer printout, etc, so straight word limit cannot be given) Examination assesses: Graduate capabilities 1-3, Learning outcomes 1-3 LIWC linked to field trip / observations at foundation construction sites.

VAC3092 STRUCTURAL DESIGN

Locations: Footscray Park.

Prerequisites:VAN2032 - ENGINEERING DESIGN

Description: This unit of study aims to give students a basic understanding, problem solving and design skills in the areas of structural design using timber, steel and reinforced concrete. It covers the following topics: Dead and live loads. Timber beams and columns. Nailed and bolted connections in timber members in simple shear. Steel beams, steel girders with high shear forces, steel columns, bolted and welded connections in steel members. Reinforced concrete design for simple and continuous beams. Beam bending, deflection and shear. Single and double reinforcement in beams. Reinforced concrete column design.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students will have demonstrated:

- an understanding of key issues and design principles involved in basic structural design using timber, steel and reinforced concrete
- an ability to locate and effectively use information / data relevant to this area.
- an ability to identify, formulate and solve related problems, and to carry out associated design work.
- an ability to evaluate solutions against technical, environmental, economic and social criteria.
- an ability to work effectively as a member and/or leader of a team, and to time manage multiple tasks.
- good communication skills, based on technical reports and oral presentations.

Class Contact: This unit will be delivered in PBL mode, and will comprise 60 hours (5 hours equivalent per week) of sessions made up of small group work, team meetings, lectures, design workshops, seminars, practical work and site visits. In addition, students are expected to devote at least the same amount of time for private and/or group study. The unit is worth 12 credit points.

Required Reading: Gorenc, B. Tinyou, R. and Syam, A. (1996), Steel Designers Handbook, 7th edition, UNSW Press; AS4100 Steel Structure Code (2002), Standards Association of Australia; Warner, R.F., Rangan, B.V., Hall, A.S. and Faulkes, K.A. (1998) Concrete Structures Longman; AS3600. Concrete Structures Code (2002), Standards Association of Australia; AS1720.1 - 1997, 'Australian Standard - Timber Structures - Part 1: Design Methods,' Standards Australia; Class Notes.

Assessment: Based 100% on an individual portfolio which documents evidence that the learning outcomes have been achieved. The portfolio may include skills audit results, design assignment / project reports including technical calculations, site visits, a reflective journal, workbook(s), and self and peer assessment. Further details on portfolio components will be issued to students during the first week of classes.

VAC3192 STRUCTURAL ENGINEERING DESIGN 1

Locations: Footscray Park.

Prerequisites:VAC2092 - INTRODUCTION TO STRUCTURAL ENGINEERING DESIGNVAC3021 - STRUCTURAL ANALYSIS

Description: This unit of study aims to give students a fundamental understanding in the design of reinforced concrete structural elements. The following topics are covered: Design of reinforced concrete simply supported and continuous beams in bending, shear and torsion. Serviceability design of beams including deflection and crack control. Design of one-way and two-way slabs using method of coefficients. Analysis of Flat slabs using simplified strip and equivalent frame methods, including punching shear. Reinforced concrete column and wall design. Introduction to strut and tie method, pre-stressed concrete and footing design.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Analyse and design reinforced concrete beams in both strength and serviceability states (for bending, shear, torsion, deflection and crack control); Analyse and design reinforced concrete one-way and two-way slabs (including flat plates); Analyse and design members in combined compression and bending (i.e.columns and walls); Use relevant Australian codes of practice in the design of concrete structures; Formulate and solve specific concrete design problems, and work both autonomously and as a member of a team.

Class Contact: Sixty (60) hours for one semester comprising a mixture of lectures, tutorials and design workshop activities.

Required Reading: The prescribed text 1 is supplemented by resource material placed on WebCT.1. Loo, Y.C. and Chowdhury, S.H. 1st Ed Reprinted 2011 Reinforced & Prestressed concrete: Analysis and design with emphasis on the application of AS3600-2009 Cambridge Press 2. Standards Australia 2009 AS3600-2009 Concrete structures Standards Australia 3. Warner, R. F., Rangan, B. V., Hall, A. S. and Faulkes, K. A. 1998 Concrete structures Longman, Melbourne Texts 2 and 3 are recommended reading materials.

Assessment: Test, Mid-semester skills audit (1.5hrs), 20%. Examination, End of Semester Examination (3hrs), 40%. Assignment, Homework Problems (weekly), 20%. Project, PBL project (20 pages approx.), 20%. Assessment Item 1 addresses graduates capabilities 1 and 2; and learning outcomes 1 and 4. Assessment Item 2 addresses graduates capabilities 1 and 2; and learning outcomes 1 to 5. Assessment

Item 3 addresses graduates capabilities 1,2 and 5; and learning outcomes 1 to 5. Assessment Item 4 addresses graduates capabilities 3,4 and 5; and learning outcome 1 to 6. .

VAC4021 STRUCTURAL ENGINEERING ANALYSIS AND DESIGN 1

Locations: Footscray Park.

Prerequisites:VAC3092 Structural Design

Description: Analysis: Plastic Analysis/Design of Steel Frames - Stress-strain curve for steel, moment-curvature relationship, plastic modulus of section. Mechanisms for failure of beams and frames, yield and equilibrium conditions. Load factor. Upper and lower bound theorems. Combined bending and axial loads.Buckling of elastic structures - Introduction, Euler load, buckling modes, long and short columns, effective length, slenderness ratio; theoretical and practical columns, secant formula; tangent modulus and secant modulus methods. Practical techniques for solving buckling problems. Australian standards relavant for design of columns. Buckling of plates.Design: Wind loads. Design of a steel portal frame building: cladding, secondary 'cold formed' members, framing systems for low-rise buildings, roof and wall bracing, computer analysis,rafters, columns, connections, knee and splice connections, and 'plastic' design of steel frames. Reinforced concrete elements: continuous beams, slender columns, slabs: method of coefficients, yield line analysis and design, strip method, equivalent frame.

Credit Points:12

Class Contact:three hrs of lectures and two hrs of tutorials per week.

Required Reading: Hibbler R.C., 2005, Structural Analysis. (6th edition). Pearson International; Gorenc, B. Tinyou, R. and Syam, A., (1996), Steel Designers Handbook 6th edition, UNSW Press; AS4100 Steel Structure Code (2002), Standards Association of Australia; Warner, R.F., Rangan, B.V., Hall, A.S. and Faulkes, K.A. (1998), Concrete Structures Longman; AS3600. Concrete Structures Code (2002), Standards Association of Australia; 'WebCT' VU web site for this subject and class notes.

Assessment: Analysis Part:Stage test: Based on weeks 1-6, 25%; Assignment 1: Structural model design/making/testing/reporting (Calculations, sketches, max equivalent word limit of 1000), 20%; Assignment 2: Computer structural analysis (Calculations, sketches, max equivalent word limit of 1000), 15%; one hour examination, 40%Design Part: three hour mid-semester supervised assignment. This assessment will be largely open-book, 40%;The assignment will be done under supervision to control plagiarism (Calculations, sketches, max word limit of 1500)2 hour examination, 60%; Subject final result derived from weightings = 60% to Design part and 40% to Analysis part.

VAC4022 STRUCTURAL ENGINEERING ANALYSIS AND DESIGN 2

Locations: Footscray Park.

Prerequisites:VAC4021 Structural Engineering Analysis & Design 1.

Description: Design topics: introduction to prestressed concrete, deflections of prestressed concrete beams, loss of prestress, flexural strength, strength at transfer, design for shear, anchorage zones, continuous prestressed concrete beams, prestressed concrete slabs, strut-and-tie modelling of structural concrete, reinforced concrete footings. Analysis topics: basic concepts of finite element analysis, rod finite element, beam finite element, triangular finite element, analysis of 2D and 3D structures using the commercial finite element analysis system Strand7.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Analyse and design prestressed concrete beams for strength and serviceability; 2.Analyse and design prestressed concrete slabs for strength and serviceability; 3. Analyse and design non-flexural concrete members using the strut-and-tie model approach; 4. Analyse and design reinforced concrete footings; 5. Identify the basic concepts of finite element analysis; 6. Analyse 2D and 3D structures using a commercial finite element analysis package.

Class Contact:three hrs of lectures and two hrs of tutorials per week

Required Reading: Cook, R.D., Malkus, D.S., Plesha, M.E. and Witt, R.J. (2001), Concepts and Applications of Finite Element Analysis, 4th edition, John Wiley & Sons, New York. Warner, R. F., Rangan, B. V., Hall, A. S. and Faulkes, K. A. (1998). Concrete structures, Longman, Melbourne. Standards Australia. (2003). Australian standards for civil engineering students: AS HB2.2 structural engineering, Standards Australia.

Assessment: Assignment, Assignment 1, 20%. Assignment, Assignment 2, 20%. Examination, Final Exam (3 hours), 60%.

VAC4032 CIVIL ENGINEERING DESIGN 2

Locations: Footscray Park.

Prerequisites:VAC3031 - CIVIL ENGINEERING DESIGN 1VAC3042 - HYDRAULIC ENGINEERINGVAC3062 - GEOTECHNICAL ENGINEERINGVAC4081 - ENVIRONMENTAL ENGINEERING 1

Description: The main objective of this unit is to give students the ability to perform preliminary civil engineering designs with an appreciation of how the design will impact on the environment. Students will work in small design teams to carry out four designs drawn mainly from the areas of water, environmental, structural, geotechnical, and transportation engineering. This unit also aims to further develop the ability of students to apply sustainable development aspects into their designs.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an understanding of how to approach a civil engineering design problem or project; 2. Identify / formulate / solve design problems, and complete associated design work in a number of civil engineering disciplines; 3. Locate and effectively use information / data relevant to these areas; 4. Use a system approach to design, and evaluate solutions against technical, environmental, economic and social criteria work effectively as a member and/or leader of a team; 5. Demonstrate good communication skills, based on technical reports, team discussions and oral presentations.

Class Contact: Sixty (60) hours for one semester comprising design workshops / seminars and student team design work.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Report, Group project report - maximum of 15 pages, 40%. Presentation, Oral presentation - maximum of 6 minutes, 10%. Portfolio, Portfolio - maximum of four A4 pages, 10%. Examination, Two hours, 40%. Students will work in teams of 3-4 students on four designs with a group project report worth10% each . Students will deliver one oral presentation (6 minutes) on one of the designs which is worth 10%. The portfolio will normally include skills audit results and design reports including technical calculations, but may also include a reflective journal, workbook(s), and self and peer assessment with a maximum of 4 pages. Further details on portfolio components will be issued to students during the first week of classes. Two hour final exam covering all four designs worth 40%. Report covers Learning Outcomes 1-5 and Graduate Capabilities 1-6. Oral presentation covers Learning Outcomes 1, 3 and 5 and Graduate Capabilities 1, 3, 4 and 5. Portfolio covers Learning Outcomes 1-5 and Graduate Capabilities 1-6. Final test covers Learning Outcomes 1-5 and Graduate Capabilities 1-6. .

VAC4071 TRANSPORTATION ENGINEERING

Locations: Footscray Park.

Prerequisites: Nil.
Description: Demand for transport and the significance of transport and freight movement to the economy; road safety issues; transport planning techniques including trip generation, trip distribution, mode split and trip assignment models. Traffic engineering aspects - flow theory; road capacity; headways; gaps; speed analysis. Intersection analysis; use of SIDRA program to aid design and analysis of signalised intersections; traffic survey methods and analysis; local area traffic management studies; travel demand management.
Credit Points:6
Class Contact:two hrs of lectures and one hr of tutorials per week.
Required Reading: Austroads (1988) Traffic Engineering Practice Vols. 1-12; Class Notes.
Assessment: Assignment 1: Site Investigations Report (2000 words), 15%; Assignment 2: Trip generation and trip distribution (Calculations & analysis equivalent to approx. 6 pages), 15%; three hour examination, 70%.

VAC4072 ENVIRONMENTAL PLANNING AND DESIGN

Locations: Footscray Park.
Prerequisites: Nil.
Description: This subject covers areas of sustainable rural and urban land development including biophysical and socio-economic data collection and inventories, environmental sensitivity mapping and land capability analysis, green city/urban forest concepts, planning permit issues and processes including meeting procedure, open space concepts and energy and water conservation, residential subdivisions and appropriate street designs.
Credit Points:6
Class Contact:two hrs of lectures and one hr of tutorials per week.
Required Reading: Victoria, Dept. of Infrastructure , 2001, Victoria Planning Provisions (incorporating Rescode.); Class Notes.
Assessment: Assignment 1: Land development suitability report 1500 words plus sketches, 16%; Assignment 2: Planning meeting report - 1200 words, 10%; Assignment 3: Subdivision and street design - calculations and engineering drawing equivalent to approx.12 pages, 24%; 1.5 hour examination, 50%.

VAC4081 ENVIRONMENTAL ENGINEERING 1

Locations: Footscray Park.
Prerequisites:VAC3042 - HYDRAULIC ENGINEERINGSome of the material covered in VAC3042 is now considered essential knowledge for successful completion of VAC4081
Description: Wastewater characteristics and estimation of wastewater flows. Types, design, maintenance and rehabilitation of collection systems. Wastewater treatment plant types and applications, unit processes involved and design of components. Land treatment methods and wastewater reuse. On-site wastewater treatment. Water pollution and quality changes in rivers, estuaries and lakes, including erosion and siltation problems. Point and non-point source water pollution and control. Urban runoff quality and its management. Water quality modelling and overview of available models. Causes of land degradation and methods of control/ rehabilitation. Principles and design of surface and subsurface land drainage systems.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate understanding of processes and key issues relating to wastewater management, water quality and pollution control, and land degradation / rehabilitation; 2. Locate and effectively use information / data relevant to these areas; 3. Identify, formulate and solve related problems, and carry out associated design work; 4. Evaluate solutions against technical, environmental, economic and social criteria; 5. Work effectively as a member and/or leader of a team; 6. Demonstrate good communication skills, based on technical reports and team discussion and/or oral presentations.
Class Contact:60 hours comprising lectures, tutorials and field work
Required Reading: Lechte, P. (20**) VAC4081 Environmental Engineering 1 - Notes and Problem Sheets, Sem 2, 20** Victoria University (VU; 20** indicates current year edition)
Assessment: In order to be eligible for either a pass or supplementary assessment, students must get at least 40% on the end-of-semester examination Test, Class test, 10%. Assignment, Field & problem-based team assignment, in 2-3 parts, 30%. Examination, 3 hr end-of-semester exam, 60%. Test assesses: Graduate capability 4, Learning outcome 1 Assignment assesses: Graduate capabilities 1-5,Learning outcomes 2-5 (assignment is normally split into 2-3 parts, with total max no. of pages / student ~10 (may include text, diagrams / plans,photos, calculations / computer output, etc, so straight word limit cannot be given)). Examination assesses: Graduate capabilities 1-3, Learning outcomes 1-3 LIWC linked to simulated work environment and field investigation part of assignment.

VAC4082 ENVIRONMENTAL ENGINEERING 2

Locations: Footscray Park.
Prerequisites: Nil.
Description: Overview of a range of environmental problems, and introduction to Basic Ecology. Solid Waste Management: sources, types/quantity of wastes, hierarchy of management options, collection methods and transfer stations, disposal by landfill and other methods. Air Pollution: types, causes and effects, clean up and control. Noise Pollution: sources and effects, solutions to noise problems. Environmental Management including auditing, risk and environmental impact assessment, community consultation programs, and sustainable development issues. Coastal Engineering: coastal forms, wave generation and height prediction, wave phenomena, sediment transport and impact, beach erosion/rehabilitation, marinas and fixed or floating breakwaters, coastal management.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Discuss processes and key issues relating to ecology, energy and general environmental management issues, solid waste management, air and noise pollution and control arrangements, environmental impact assessment, and coastal engineering which involves a site visit; 2. Solve a range of environmental problems and carry out design tasks in arbitrarily assigned local situations; 3. Apply science and engineering principles, identify problems and apply formulations and solutions; 4. Develop effective communication skills; 5. Apply a system approach to design, including an understanding of the more integrated nature of engineering responsibilities, and a capacity to undertake life-long learning.
Class Contact: Sixty (60) hours for one semester comprising lectures and tutorials.
Required Reading: No prescribed text books. The study materials will be available on WebCT.
Assessment: Assignment, Participation in a series of in-class debates on issues of environmental impact, 15%. Assignment, Coastal Engineering site visit report- - Maximum of four A4 pages, 15%. Test, One hour class test covering materials from weeks 1-3, 20%. Examination, Two hour end-of-semester examination, 50%. Site visit is the LIWC component, which carries 15% of the total assessment marks. Assignment 1 covers Learning Outcomes 1,4 and 5 and Graduate Capabilities 3-6. Assignment 2 covers Learning Outcomes 2-5 and Graduate Capabilities 1-6. Test covers Learning Outcomes 1-4 and Graduate Capabilities 1-4. Final exam covers Learning Outcomes 1-5 and Graduate Capabilities 1-6.

VAC4091 STRUCTURAL ENGINEERING DESIGN 1

Locations: Footscray Park.

Prerequisites:VAC3092 Structural Design.

Description: Wind loads. Design of a steel portal frame building: cladding, secondary 'cold formed' members, framing systems for low-rise buildings, roof and wall bracing, computer analysis,rafters, columns, connections, knee and splice connections, and 'plastic' design of steel frames. Reinforced concrete elements: continuous beams, slender columns, slabs: method of coefficients, yield line analysis and design, strip method, equivalent frame.

Credit Points:6

Class Contact:two hrs of lectures and one hr of tutorials per week.

Required Reading: Gorenc, B. Tinyou, R. and Syam, A. (1996) Steel Designers Handbook 6th edition, UNSW Press; AS4100 Steel Structure Code (2002), Standards Association of Australia; Warner, R.F., Rangan, B.V., Hall, A.S. and Faulkes, K.A. (1998) Concrete Structures Longman; AS3600. Concrete Structures Code (2002), Standards Association of Australia; Class Notes.

Assessment:three hour mid-semester supervised assignment (This assessment will be largely open-book), 40%; two hour examination,60%.

VAC4092 STRUCTURAL ENGINEERING DESIGN 2

Locations: Footscray Park.

Prerequisites:VAC4091Structural Engineering Design 1.

Description: Introduction to prestressed concrete, deflections of prestressed concrete beams, loss of prestress, flexural strength, strength at transfer, design for shear, anchorage zones, continuous prestressed concrete beams, prestressed concrete slabs, strut-and-tie modelling of structural concrete, reinforced concrete footings.

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Analyse and design prestressed concrete beams for strength and serviceability; 2. Analyse and design prestressed concrete slabs for strength and serviceability; 3. Analyse and design non-flexural concrete members using the strut-and-tie model approach; 4. Analyse and design reinforced concrete footings.

Class Contact:two hrs of lectures and one hr of tutorials per week.

Required Reading: Standards Australia. (2003). Australian standards for civil engineering students: AS HB2.2 structural engineering, Standards Australia. Warner, R. F., Rangan, B. V., Hall, A. S. and Faulkes, K. A. (1998). Concrete structures, Longman, Melbourne.

Assessment: Assignment, Assignment 1, 40%. Examination, Final Exam (2 hours), 60%.

VAC4172 URBAN DEVELOPMENT AND TRANSPORTATION

Locations: Footscray Park.

Prerequisites: Nil.

Description: This subject covers areas of sustainable urban land development and transportation systems including biophysical and socio-economic data collection and inventories, land capability analysis, planning processes and issues including population density, city infill vs peripheral development, infrastructure and servicing requirements, open space/green city/urban forest concepts, energy and water conservation issues, residential subdivisions and appropriate street designs. It also focuses on demand for transport and the significance of transport and freight movement to the economy; road safety issues; transport planning techniques including trip generation, trip distribution, mode split and trip assignment models; traffic engineering aspects including flow theory, road capacity, headways,gaps, and speed analysis; intersection analysis and use of SIDRA program to aid design and analysis of signalised intersections; traffic survey methods and analysis; local area traffic management studies; travel demand management.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate understanding of key issues and principles relevant to the design of sustainable urban areas and related transportation systems; 2. Locate and effectively use information / data relevant to such design work; 3. Identify, formulate and solve related problems, and carry out associated design work; 4. Evaluate solutions against technical, environmental, economic and social criteria; 5. Work effectively as a member and/or leader of a team 6. Demonstrate good communication skills, based on technical reports and team discussion and/or oral presentations.

Required Reading: Evans, G. (20**), VAC4172 Urban Development and Transportation Notes, sem 2, 20** Victoria University (VU; 20** indicates current year addition)

Assessment: Assignment, 1 x Field-based and 1x Design/modelling, 40%. Examination, Final, 60%.

VAC4191 STRUCTURAL ENGINEERING DESIGN 2

Locations: Footscray Park.

Prerequisites:VAC3192 - STRUCTURAL ENGINEERING DESIGN 1

Description: This unit introduces the analysis and design of steel and steel-concrete composite structures. The unit covers: wind loads, local buckling of thin steel plates, steel members under combined actions, steel connections, roof and wall bracing systems, plastic analysis of steel beams and frames, computer analysis, steel-concrete composite slabs, composite beams, and composite columns.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Estimate wind loads;
- Analyse and design steel members under combined actions and steel connections;
- Analyse steel beams and simple frames using the plastic method;
- Perform structural analyses on frames and trusses using computer software;

5. Analyse and design steel-concrete composite slabs, beams and columns.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorials.

Required Reading: Gorenc, B. E., Tinyou, R. and Syam, A. (2005). 7th edn, Steel designers' handbook. Sydney, UNSW Press. Standards Australia. (2003). Australian standards for civil engineering students: AS HB2.2 structural engineering. Sydney, Standards Australia.

Assessment: Assignment, Assignment 1 (Maximum 35 A4 pages), 25%. Assignment, Assignment 2 (Maximum 35 A4 pages), 25%. Examination, Final Exam (2 hours), 50%. Notes: Assignment 1: Learning Outcomes 1, 2 and 4, Graduate Capabilities 1-6, LiWC project for a workplace. Assignment 2: Learning Outcome 5, Graduate Capabilities 1-6. Final Exam: Learning Outcomes 1, 2, 3 and 5, Graduate Capabilities 1-6.

VAC4192 STRUCTURAL ENGINEERING DESIGN 3

Locations: Footscray Park.

Prerequisites:VAC4191 - STRUCTURAL ENGINEERING DESIGN 2VAC3021 - STRUCTURAL ANALYSIS

Description: This unit introduces the analysis and design of prestressed concrete structures and the finite element method. Topics dealing with the analysis and design of prestressed concrete structures include: introduction to prestressed concrete, deflections of prestressed concrete beams, loss of prestress, flexural strength, strength at transfer, design for shear, anchorage zones, continuous prestressed concrete beams, prestressed concrete slabs, strut-and-tie modelling of structural concrete, and reinforced concrete footings. Topics devoted to the finite element method include: basic concepts of finite element analysis, truss finite element, beam finite element, triangular finite element, and analysis of 2D and 3D structures using the finite element analysis program Strand7.
Credit Points: 12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: Analyse and design prestressed concrete beams for strength and serviceability; Analyse and design prestressed concrete slabs for strength and serviceability; Analyse and design non-flexural concrete members using the strut-and-tie model approach; Analyse and design reinforced concrete footings; Analyse simple 2D truss, frame and continuum structures using the finite element method; Analyse 2D and 3D structures using finite element analysis software.
Class Contact: Seventy-two (72) hours for one semester comprising lectures and tutorials.
Required Reading: Warner, R. F., Rangan, B. V., Hall, A. S. and Faulkes, K. A. (1998). Concrete structures. Melbourne: Longman. Cook, R.D., Malkus, D. S., Plesha, M. E. and Witt, R. J. (2001), 4th edition, Concepts and applications of finite element analysis. New York, John Wiley & Sons. Standards Australia. (2003). Australian standards for civil engineering students: AS HB2.2 structural engineering. Sydney, Standards Australia.
Assessment: Assignment, Assignment 1 (Maximum 35 A4 pages), 25%. Assignment, Assignment 2 (Maximum 35 A4 pages), 25%. Examination, Final Exam (3 hours), 50%. Notes: Assignment 1: Learning Outcome 1, Graduate Capabilities 1-6, LiWC project for a workplace. Assignment 2: Learning Outcome 6, Graduate Capabilities 1-6. Final Exam: Learning Outcomes 1-5, Graduate Capabilities 1-6. .

VAE704 PHYSICS A

Locations: Sunshine.
Prerequisites: Nil.
Description: PHYSICS A
Required Reading: No Requied Reading

VAE705 PHYSICS B

Locations: Sunshine.
Prerequisites: Nil.
Description: PHYSICS B
Required Reading: No Required Reading

VAG505 URBAN ROAD DESIGN

Locations: Sunshine.
Prerequisites: Nil.
Description: URBAN ROAD DESIGN
Required Reading: No Required Reading

VAM2011 COMPUTATIONS AND ENGINEERING ANALYSIS

Locations: Footscray Park.
Prerequisites: RMA1002 Engineering Mathematics 1A, and VAN1011 Experimentation and Computing.
Description: Solving engineering problems numerically. Computer programming. Keywords in a computer language. Variables and data types. Operators and flow control. Structured programming. Functions in programming. Visualisation of data. Advanced graphics - mesh and surface plots. Handles and properties of graphic objects. Integration of programs into software. Event driven programs. Creating a Graphical User's Interface (GUI). Analysis of engineering systems. Examples of first and second order systems in engineering. Initial and boundary value problems. Numerical simulation of the time response of engineering systems by solving ordinary differential equations. Frequency domain. Transformation from the time to the frequency domain by Fourier transform. Characteristics of a system: impulse response and frequency response functions.
Credit Points: 12
Class Contact: 60 hours in one semester comprising lectures/tutorials/computer laboratory.
Required Reading: Palm W.J. (2001) Introduction to Matlab 6 for Engineers, McGraw-Hill; Magrab E.B et al (2005) An Engineer's Guide to MATLAB® 2nd edition, Pearson Prentice Hall (ISBN 0-13-145499-4); Class notes and on-line material
Assessment: Computing test 1: two hours based on weeks 1–5, 30%. Computing test 2: two hours based on weeks 7-11, 30%; Theory test - two hours, 30%; On-going lab assignments (Word limit of 1000), 10%

VAM2042 THERMODYNAMICS AND FLUID MECHANICS 1

Locations: Footscray Park.
Prerequisites: VAN2041 Thermofluids.
Description: Second law of thermodynamics and entropy. Gas mixtures. Refrigeration cycles. Gas-vapour mixture and air-conditioning. Dimensional analysis, dimensionless numbers and introduction to modelling principles. Measurements in fluid mechanics. Introduction to conservation laws in differential forms.
Credit Points: 12
Class Contact: three hrs of lectures and two hrs of tutorial/laboratory sessions per week.
Required Reading: Comprehensive class, laboratory and activity notes. On-Line material; Cengel, Y. A. and Boles, M. A. 2002 Thermodynamics- An Engineering Approach, 4th Edition, McGraw; White, F., 2002 Fluid Mechanics, 5th edn, McGraw Hill.
Assessment: Class Test: based on weeks 1- 6 (calculations, sketches, max word limit of 1000 words), 10%; Class Test: based on weeks 6- 12 (calculations, sketches, max word limit of 1000 words), 10%; Assessment 3: Lab on Venture tube (calculations, sketches, max word limit of 1000 words), 10%; Assessment 4: Lab on refrigeration unit (calculations, sketches, max word limit of 1000 words), 10%; Final Exam: 3hrs, 60%.

VAM2062 MATERIALS AND MANUFACTURE

Locations: Footscray Park.
Prerequisites: VAN2061 Engineering Materials.
Description: Diffusion in solids and the application of mathematical diffusion models to surface treatments of alloys. Thermo- mechanical strengthening treatments of metal alloys. Structure and properties of ferrous, aluminium, magnesium, zinc, nickel, copper and titanium alloys, and their applications in engineering design. Structure, properties and heat treatment of ceramics and glasses.Introduction and structure to polymers, elasomers, foams and polymer composites. Casting processes metals and polymers. Introduction to plasticity theory and its application to solid forming processes. Introduction to surface physics and its application to powder metallurgy and joining processes.
Credit Points: 12

Learning Outcomes: Upon successful completion of this subject, students will be able to demonstrate:

- an understanding of processes and key issues related to engineering science in manufacturing and environment.
- an ability to solve a range of numerical engineering problems found in engineering practice and engineering design.
- an ability, within the context of the subject areas above, to find and use relevant information, to formulate and solve specific problems, to work both autonomously and as a member of a team, and to effectively communicate ideas, issues, investigations and results by a variety of methods.

Class Contact: 5 hrs equivalent per week of sessions made up of small group work, team meetings, workshops, seminars and laboratory sessions. In addition, students are expected to devote at least this much time for private and/or group study.
Required Reading: Rojter, J. (2005), Fundamentals of Materials Technology, Victoria University. Class NotesRojter, J. (2005), Structure and Mechanical Properties of Solids1, Victoria University. Class NotesRojter, J. (2005), Manufacturing Materials: Part 1, Victoria University. Class NotesCallister, W.D. Jr (2004), Materials Science and Engineering- An Introduction, John Wiley and Sons Inc Higgins, R.A. (2005), Engineering Metallurgy, Edward ArnoldKalpakjian, S. (2002), Manufacturing Engineering and Technology, Addison- Wesley
Assessment: An individual portfolio which providesevidence that demonstrates that the learning outcomes have been achieved. The portfolio may include skills audits, laboratory reports, site visit / project reports, reflective journals, workbooks, self and peer assessment.

VAM2111 INTRODUCTION TO ENGINEERING MATERIALS

Locations: Footscray Park.
Prerequisites: ENF1201 - ENGINEERING MATHEMATICS 2ENF1202 - ENGINEERING PHYSICS 2
Description: Introduction to mechanical behaviour of solids under static and dynamic conditions. Atomic structure and bonding and its effect on mechanical and physical properties of solids. Introduction to microstructures of polymers, metals and ceramics. Fundamentals of cement and concrete microstructure- property relationships; classification of cementitous materials for engineering design. Deformation mechanisms in crystalline solid. Mechanism of strengthening of metals; phases in alloys. Introduction to phase diagrams and their application to ferrous alloys. Phase transformations through time-temperature- transformations and their applications to heat treatment of plain carbon steels and cast irons. Structure-property relationship in alloy and stainless steels.
Credit Points: 12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Display an understanding of microstructure- property relationship of solid materials; 2. Show an appreciation of limitations of basic materials in engineering design; 3. Display cognitive skills in decision-making process for areas of optimum engineering design; 4. Cognisance of the role materials play in maintaining a sustainable environment.
Class Contact: Sixty (60) hours or equivalent for one semester comprising of a mix of lectures, small group work, workshops and laboratory exercises.
Required Reading: Rojter, J., 2010 Introduction to Engineering Materials, Lecture notes Victoria University Callister, D.W. Jr., 2009 Materials Science and Engineering- An Introduction John Wiley & Sons
Assessment: Examination, Skills audit of tacit knowledge, 45%. Report, Problem-Project group assignment, 35%. Report, Laboratory - enquiry based, 12%. Presentation, Oral presentation and reflective journals, 8%.

VAM2112 THERMODYNAMICS 1

Locations: Footscray Park.
Prerequisites: VAN2041 - THERMOFLUIDS
Description: Second law of thermodynamics, heat engines, thermal efficiency, heat pumps, coefficient of performance, reversible and irreversible processes, Carnot cycle, Carnot principles, Thermodynamics temperature scale, quality of energy, Carnot heat engine, Carnot refrigeration and heat pump. Entropy, increase of entropy principle, entropy of pure substance, isentropic processes, the T-s relations, the entropy change of ideal gases, reversible steady-flow work, isentropic efficiencies of steady-flow devices, entropy balance. Availability analysis, reversible work and irreversibility, second law efficiency, availability transfer by heat, work and mass, availability balance: closed and open systems. Refrigeration cycles, refrigerators and heat pumps, the ideal vapour-compression refrigeration cycle, actual vapour-compression refrigeration cycle, and multistage compression refrigeration systems.
Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify the various concepts related to the Second Law of Thermodynamics and their engineering applications;
- Define the entropy and its application in determining the quality of energy;
- Explain the availability and its applications in determining possible regeneration and energy recovery in engineering devices;
- Determine the irreversibility of engineering processes;
- Define the refrigeration process and calculate the coefficient of performance of ideal and actual vapour-compression refrigeration systems.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorial/laboratory sessions.
Required Reading: Comprehensive class, laboratory and activity notes. On-Line material; Cengel, Y. A. and Boles, M. A. 2008 6th Edition, Thermodynamics- An Engineering Approach, McGraw.
Assessment: Test, Class test; calculations, sketches, max.1000 words, 10%. Test, Class test; calculations, sketches, max.1000 words, 10%. Assignment, Laboratory on Refrigeration unit; calculations, sketches, max.1000 words, 10%. Examination, Final, 70%.

VAM2121 MECHANICS OF ENGINEERING MATERIALS

Locations: Footscray Park.
Prerequisites: ENF1102 - ENGINEERING PHYSICS 1ENF1202 - ENGINEERING PHYSICS 2
Description: Revision of: Concepts of internal forces: axial force, shear force, bending moment, torsion; Young's modulus and Poisson's ratio; Hooke's law. Internal forces diagrams; Bending stress and shear stress in beams;Mechanical behaviour of engineering materials; Structures and Mechanisms. Three dimensional forces and moments. Different types of structures, supports and reactions; Modes of failures. Deflection in beams; Shear stress and angle of twist in shafts. Buckling phenomenon. Complex loading; Two dimensional stress; Mohr's circles of stresses and strains; Theories of failures for ductile and brittle material behaviour. Statically

indeterminate structures. Energy methods to find displacements of structures; strain energy; virtual work; Castigliano's theorems; Unit force method.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Characterise general behaviour of engineering materials and different modes of failure under effects of forces, moments, change of temperatures and humidity; 2. Evaluate effects of three dimensional and complex loading of forces and moments on one-dimensional structures commonly found in mechanical engineering (links, ties, struts, beams, shafts) in terms of stresses, strains and displacements; 3. Apply the principles of mechanics engineering materials to the analysis and design of structures and machinery components in mechanical engineering.

Class Contact: Sixty (60) hours for one semester comprising lectures, laboratory, seminars and group activities.

Required Reading: Lecture Notes by Danh Tran.

Assessment: Examination, Final, 50%. Assignment, Team Report and Individual Portfolio, 30%. Laboratory Work, Individual Reports, 20%.

VAM2122 STRESS ANALYSIS

Locations: Footscray Park.

Prerequisites:VAM2121 - MECHANICS OF ENGINEERING MATERIALS

Description: Three dimensional stress analysis. Three dimensional strain analysis. Stress-strain relationship. Plane stress and plane strain problems. Photoelasticity. Strain gauge. Polar coordinate problems. Thick cylinder and rotating disc. Theory of plate and shell. Advanced composite materials. Inelastic problems of plasticity, creep and stress relaxation and applications in mechanical engineering.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Formulate and solve general three dimensional problems of stress-strain analysis especially fundamental problems of elasticity in mechanical engineering; 2. Apply experimental techniques of stress analysis, especially photoelasticity and strain gauges; 3. Apply the principles of stress analysis to advanced problems involving composite materials and inelasticity.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials, laboratory.

Required Reading: Lecture Notes by Danh Tran.

Assessment: Examination, Final, 60%. Test, Test and Assignment, 20%. Laboratory Work, Individual Reports, 20%.

VAM2131 ENGINEERING ANALYSIS

Locations: Footscray Park.

Prerequisites:ENF1201 - ENGINEERING MATHEMATICS 2ENF1202 - ENGINEERING PHYSICS 2

Description: This Unit of Study introduces students to the methodology of application of fundamentals laws of physics, mathematical concepts and computer programming tools in the process of systematic analysis of behaviour of engineering systems. It exposes students to generic analytical skills and methods relevant to contemporary engineering practice and illustrates their practical application in the analysis of various generic engineering systems. It covers the following topics: Introduction to the analysis of engineering systems. Formulation of simple numerical predictive models of mechanical systems. Transfer function. Familiarisation with and the application of a modern environment for numerical simulations involving Ordinary Differential Equations. Graphical presentation of complex sets of results. Instrumentation and sensors for mechanical processes. Signals. Measurement and collection of experimental data such as sound and vibration, and internal combustion engine cylinder pressure and dynamometer data. Processing and analysis of experimental data, e.g. calculation of p-V diagram and indicated work, engine overall efficiency, room sound reverberation time, vibration level, signal power and RMS. Fourier theorem, the frequency domain and frequency spectrum. Application of Fast Fourier Transform.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Identify approaches in engineering system analysis, Formulate models of simple engineering systems with Ordinary Differential Equations and transfer functions; Numerically simulate behaviour of these systems; Acquire and process large sets of experimental data and derive dependent parameters through computer programming; Produce frequency spectra using Fast Fourier Transform and interpret them; 6. Produce written technical reports as part of a team.

Class Contact: Sixty (60) hours for one semester comprising lectures, team project activities, field and laboratory experimentations and computer laboratories.

Required Reading: Palm W.J. (2003) Introduction to MATLAB® 7 for Engineers, McGraw-Hill. Magrab E.B et al (2005) 2nd edition, An Engineer's Guide to MATLAB® Pearson Prentice Hall (ISBN 0-13-145499-4)

Assessment: Formative assessment in the form of group reports. These will be assessed as satisfactory (0) or unsatisfactory (1). Other, Progress quizzes and diary, 10%. Examination, Final, weighted by the average score for group reports, 90%.

VAM2132 MANUFACTURING MATERIALS

Locations: Footscray Park.

Prerequisites:VAM2111 - INTRODUCTION TO ENGINEERING MATERIALS

Description: This subject will aim to extend the knowledge of materials science in alloy steels, leading edge non-ferrous alloys, polymers, ceramics and glasses and composites and integrate it into issues of sustainable engineering product design and manufacturing technologies. This subject gives students an understanding of the engineering practice through an introduction to problem solving methodology and knowledge of the responsibilities of the professional engineer. The content will include: - Merit matrices for material selection for economic and sustainable design and manufacture; - Diffusion in solids and the application of mathematical diffusion models to surface treatments of alloys; - Thermo- mechanical strengthening treatments of metal alloys; - Structure and properties of aluminium, magnesium, zinc, nickel, copper and titanium alloys, and their applications in engineering design; - Structure, properties and heat treatment of ceramics and glasses; - Introduction and structure to polymers, elastomers,foams and polymer composites; - Casting processes metals and polymers; - Introduction to surface physics and its application to powder metallurgy and joining processes; and, - The application of introductory plasticity theory to solid foerming processes

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Display understanding of processes and key issues related to engineering science in manufacturing and environment; 2. Solve a range of numerical engineering problems found in engineering practice and engineering design; 3. Display an improvement in a number of generic skills including problem identification / formulation / solution, effective communication, ability to use a system approach to design, and capacity to undertake life-long learning.

Class Contact: Sixty (60) hours or equivalent for one semester comprising of a mix of lectures, small group work, workshops and laboratory exercises.

Required Reading: Rojter, J., 2005 Manufacturing Materials, Class Notes Victoria University Kalpakjian, S., 2002 Manufacturing Engineering and Technology Addison-Wesley Higgins, R.A., 2005 Engineering Metallurgy Edward Arnold

Assessment: Examination, Skills audit of tacit knowledge, 45%. Report, Problem-

Project group assignment, 35%. Report, Laboratory - enquiry based, 12%. Presentation, Oral presentation and reflective journals, 8%.

VAM2142 MECHANICAL ENGINEERING DESIGN

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit is based on a series of problems designed to both introduce students to the design process and to apply knowledge introduced in other Year 1 units of study. The problems will therefore emphasise creative thinking in design, generating and evaluating alternatives against a range of technical, environmental, social and economic criteria, and making the final design decisions. The unit also incorporates a module on professional drawing practice including projections and views, dimensioning, different drawing types and using computer-aided design (CAD) software.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply a systematic approach to engineering design;
- Find, organise and evaluate information on a range of topics related to problems in engineering design;
- Identify and evaluate technical, environmental, social and economic factors impacting on the solution of engineering design problems;
- Use computer-aided design (CAD) software to develop and present design solutions;
- Communicate effectively with others orally, in writing and by means of engineering drawings;
- Demonstrate an ability to learn individually and collaboratively in a team environment;
- Use a personal reflective journal and demonstrate improvements in their effectiveness as learners;

8. Respond to diverse learning situations in a socially and culturally responsible manner.

Class Contact: Sixty (60) hours for one semester comprising team workshops, including supporting lectures and labs.

Required Reading: Vallero, DA, and Brasier, C, 2008, Sustainable Design: The Science of Sustainability and Green Engineering, Wiley. VU, School of Engineering and Science, 2009, 2nd edn. PBL in Engineering Manual, Victoria Univeristy VU, Faculty of Arts, 2009, 9th edn. 2009, Communication Skills Handbook for First Year Students in the Faculty of Health, Engineering and Science, Victoria University

Assessment: Report, Group Reports, 30%. Portfolio, Individual Portfolio, 70%.

VAM3012 SIGNAL ANALYSIS

Locations: Footscray Park.

Prerequisites:VAM2011 Computation and Engineering Analysis.

Description: This unit of study aims to give students an understanding of the principles of modern signal measurement and analysis with applications to mechanical engineering. It relies heavily on the development of computer algorithms and the use of specialist engineering software, and covers the following topics. Engineering measurement theory and fundamentals. Instrumentation and sensors for mechanical processes. Dynamic response of measurement systems. Data acquisition systems: analogue-to-digital converters, quantisation. Shannon's sampling theorem. Aliasing. Anti-aliasing filters. Use of data acquisition and analysis software: Matlab®, DADiSP®, HPVee®, Data file manipulation. Signal classification: Static, transient and dynamic signals, deterministic signals, random signals, non-stationary signals. Analysis and interpretation of digital experimental data: Time domain analysis: trends, RMS, moving statistics (mean, RMS), synchronous averaging, transient (shock) signals, probability distribution statistical estimates. Frequency domain analysis: Fast Fourier Transform (FFT), frequency spectra, spectrum types and scaling. Frequency response functions, coherence, signal-to-noise ratio. Introduction to wavelet transforms. The projects involve applications such as shocks and vibrations, noise contaminated signals, acoustic signals and other physical phenomena relating to modern mechanical engineering.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students will have:

- developed an understanding of processes and key issues related to modern measurement and signal analysis principles and techniques relating to mechanical engineering practice.
- demonstrated an ability to solve a wide range of problems and carry out design tasks pertaining to sensor selection and evaluation, and develop computer algorithms for a wide range of signal analysis techniques in the time and the frequency domains.
- completed work designed to improve a number of generic skills including problem identification / formulation / solution, effective oral and written communication, experimental techniques, computer skills and the ability to use a systematic approach to engineering investigation and algorithm development, as well as a capacity to undertake life-long learning.

Class Contact: This unit will be delivered in PBL mode and based on up to three projects to be undertaken by students working in teams. It will comprise 60 hours (5 hours equivalent per week) of lectures, tutorials, laboratory/field work, workshops and small group project work. In addition, students are expected to devote at least the same amount of time for private and/or group study. The unit is worth 12 credit points.

Required Reading: Bendat, J.S. and Piersol, A.G. (2000) Random Data Analysis and Measurement Procedures, Third Ed. John Wiley and Sons, New York; Randall R.B. (1987), Frequency Analysis. Bruel & Kjaer, Denmark; Newland, D.E. (2005) An Introduction to Random Vibrations, Spectral and Wavelet Analysis, Third Ed. Longman Scientific & Technical, Harlow U.K.; Matlab Online Reference Manuals; Class Notes.

Assessment: Based 100% on an individual portfolio which documents evidence that the learning outcomes have been achieved. The portfolio may include skills audit results, assignment / project reports including technical calculations, laboratory reports, a reflective journal, workbook(s), and self and peer assessment Further details on portfolio components will be issued to students during the first week of classes.

VAM3021 STRESS ANALYSIS 1

Locations: Footscray Park.

Prerequisites:VAN2021 Solid Mechanics 2.

Description: Three-dimensional stress analysis: stress vector, Cartesian stress components, equation of equilibrium, principal stresses and principal stress directions. Three-dimensional strain analysis: displacement vector, Cartesian strain components, similarity between stress and strain matrix, equation of compatibility. Experimental stress analysis: strain gauges and photoelasticity. Introduction in linear elasticity:

stress strain relationship, Lame's equations and Hooke's law, various formulation of boundary value problems, plane stress and plane strain problem, orthotropic materials, composite materials.

Credit Points:12

Class Contact:three hrs of lectures and two hrs of tutorials per week.

Required Reading: Lecture Notes by Danh Tran.

Assessment: Laboratory 1: three hour on Strain Gauge, report 2000-3000 words, 10%; Laboratory 2: three hour Photoelasticity, report 2000-3000 words, 10%; Test 1: based on Week 1-4, open book, one hour ,10%; Test 2: based on Week 6-8, open book, one hour, 10%; Examination: three hour (open book), 60%.

VAM3022 STRESS ANALYSIS 2

Locations: Footscray Park.

Prerequisites:VAM3021 Stress Analysis 1.

Description: Thick cylinders and Rotating Discs. Theory of plates and shells. Introduction to plasticity. Introduction to viscoelasticity, creep and stress relaxation. Introduction to finite element. Stress analysis by Finite Element.

Credit Points:12

Class Contact:5 hrs of lectures and tutorials per week, including Finite Element computer based laboratory using a finite element software.

Required Reading: Lecture Notes by Danh Tran

Assessment: Assignment 1: Truss analysis by Solid Mechanics and Finite Element, 1500-2000 words, 10%; Assignment 2: Stress analysis by ANSYS, 1500-2000 words, 10%; Test 1: based on Week 1-4, open book one hour, 10%; Test 2: based on Week 5-8, open book, one hour, 10%; Examination: three hour, open book, 60%.

VAM3031 MECHANICAL ENGINEERING DESIGN 1

Locations: Footscray Park.

Prerequisites:VAN2032 Engineering Design.

Description: This unit of study aims to give students broad skills in designing a range of machine elements and more interated plant used in mechanical engineering systems. It covers the following topics. Design of mechanical elements: Design of Power Screws and fasteners. Design of power transmission shafting, gears, cams and followers, Design and selection of rolling contact and journal bearings, Selection of chain drives, belt drives, clutches and couplings. Design of plant equipment: Machine Design, Design of Conveyors, Fan Duct systems, Piping systems. Pipe Flexibility. Programming for the design of mechanical elements and plant Design. Solids modelling of mechanical elements.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students will have demonstrated:

- significant knowledge and competence in the application of fundamental mechanics and scientific skills to design and selection of mechanical elements.
- development of skills to identify, formulate and solve engineering design problems in a systematic way.
- an ability to use computing methods to solve mechanical engineering design problems.
- ability to work effectively as a member and/or leader of a team and to time manage multiple tasks
- ability to use mechanical engineering design skills to solve a plant design problem experienced in industry.

Class Contact: This unit will be delivered in PBL mode, and will comprise 60 hours (5 hours equivalent per week) of sessions made up of small group work, team meetings, lectures, workshops, seminars and computing work. In addition, students are expected to devote at least the same amount of time for private and/or group study. The unit is worth 12 credit points.

Required Reading: Shigley J.E. and Mischke C.R. (2004), Mechanical Engineering Design, Seventh Metric Ed., McGraw Hill;Class Notes.

Assessment: Based 100% on an individual portfolio which documents evidence that the learning outcomes have been achieved. The portfolio may include skills audit results, assignment / project reports including technical calculations, design software development work, a reflective journal, and self and peer assessment Further details on portfolio components will be issued to students during the first week of classes.

VAM3041 THERMODYNAMICS AND FLUID MECHANICS 2

Locations: Footscray Park.

Prerequisites:VAM2042 Thermodynamics and Fluid Mechanics 1.

Description: Availability analysis and second law efficiency of Thermodynamics. Carnot engines. Gas power cycles - the Otto cycle, Diesel cycle, gas-turbine cycle, and jet-propulsion cycle. Vapor and combined power cycles - Rankine cycle, using reheat and regeneration to improve the efficiency of the Rankine cycle. Introduction to viscous flows. Laminar and turbulent flows. Detail analysis of wall shear flows (pipe and boundary layer) and free shear flows (jets and wakes).

Credit Points:12

Class Contact:three hrs of lectures and two hrs of tutorial/laboratory sessions per week.

Required Reading: Comprehensive class, laboratory and activity notes. On-Line material; Cengel, Y. A. and Boles, M. A. 2002 Thermodynamics- An Engineering Approach, 4th Edition, McGraw Hill. Hamill, I. 2001 Understanding Hydraulics, 2nd edn., MacMillan Presses; White, F., 2002, Fluid Mechanics, 5th edn, McGraw Hill.

Assessment: Class Test: based on weeks 1- 6 (calculations, sketches, max word limit of 1000 words), 10%; Class Test: based on weeks 6- 12 (calculations, sketches, max word limit of 1000 words), 10%; Assessment 3: Lab on external flows (calculations, sketches, max word limit of 1000 words), 10%; Assessment 4: Lab on Engine (calculations, sketches, max word limit of 1000 words), 10%; Final Exam: 3hrs, 60%.

VAM3071 DYNAMICS

Locations: Footscray Park.

Prerequisites:ENF1201 - ENGINEERING MATHEMATICS 2ENF1202 - ENGINEERING PHYSICS 2

Description: This unit of study aims to give students an understanding of principles of engineering dynamics including particle dynamics and rigid body dynamics (kinematics and kinetics) in two and three dimensional space, as well as to develop problem solving, computing and design skills in the areas of mechanism design and analysis. It covers the following topics. Introduction to dynamics, Kinematics of particles - rectilinear and plane curvilinear motion co-ordinates systems, 3-D curvilinear motion and relative motion. Plane kinematics of rigid bodies - rectilinear and plane curvilinear motion, relative velocity, instantaneous centre of zero velocity, relative acceleration, space curvilinear motion. Kinetics of particles - Newton's law, work and energy, impulse and momentum. Plane kinetics of rigid bodies - moments and products of inertia, Newton's law, work and energy, impulse and momentum. Three-dimensional dynamics of rigid bodies - kinematics, kinetics, gyroscopic motion.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students are expected to be able to: 1. Apply fundamental knowledge to solve problems related to particle dynamics and rigid body dynamics in two and three-dimensional space. 2. Solve a wide range of problems and carry out design tasks using kinematics of particles, plane kinematics of rigid bodies, kinetics of particles, plane kinetics of rigid bodies and three-dimensional kinematics and kinetics of rigid bodies. 3. Communicate effectively (both written and oral) and work as effective members of a team. 4. Apply experimental techniques and computer skills to real world engineering problems.

Class Contact:60 hours per semester comprising lectures, tutorials, laboratories and workshops.

Required Reading: Meriam J.L., & Kraige L.G. (2008). (6th SI ed.). Engineering mechanics: Dynamics John Wiley and Sons.

Assessment: Assignment, Laboratory report (approx. 1000 words). Group submission., 10%. Assignment, Laboratory report (approx. 1500 words). Group submission. , 20%. Assignment, Short answer mathematical problems (weekly), 10%. Examination, End-of-semester examination (3 hours), 60%. Assignments 1, 2, & 3 assess: All Learning Outcomes and Graduate Capabilities Examination assesses: Learning Outcomes 1 & 2 and Graduate Capabilities 1, 3, 4 & 5 .

VAM3072 MECHANICAL VIBRATIONS

Locations: Werribee, Footscray Park.

Prerequisites:ENF1201 - ENGINEERING MATHEMATICS 2ENF1202 - ENGINEERING PHYSICS 2

Description: This unit of study aims to give students a basic understanding of problem solving and design skills in Mechanical Vibrations. It covers the following topics: Introduction to mechanical vibrations and vibratory elements; Single Degree of Freedom Systems - free vibrations of undamped systems, free vibrations with viscous, coulomb and hysteretic damping, harmonically excited vibrations of undamped systems, response of damped systems to harmonically forced excitation and base motion, response of damped systems, equivalent viscous damping, general forcing functions; Two Degree of Freedom Systems - free vibrations of undamped systems, co-ordinate coupling, forced vibrations; Multi Degree of Freedom Systems - influence coefficients, Eigenvalue problem, determination of natural frequencies and mode shapes; vibration measurement, vibration control and random vibration analysis.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to demonstrate: 1. An understanding of key issues involved in the vibratory analysis of mechanical systems as described in the unit despriptor; 2. An ability to identify, formulate and solve problems related to mechanical vibrations and to carry out design work for controlling and managing mechanical vibrations; 3. An ability to evaluate solutions against technical, environmental, economic and social criteria; 4. An ability to work effectively as a member and/or leader of a team, and to time manage multiple tasks; 5. Good communication skills, based on technical reports, discussions and debates.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials, workshops, field work and laboratory experiments.

Required Reading: Rao S.S. (1995) Third Ed. Mechanical Vibrations Addison-Wesley Publishing Company Inman D.J. (2001) Second Ed. Engineering Vibration Prentice Hall Class Notes

Assessment: Formative assessment in the form of group reports. Each project report will be assessed as 0 (unsatisfactory) or 1 (satisfactory) and every team member receives the same mark. As these are designed to assist the learning process, unsatisfactory reports may be re-submitted after feedback has been obtained from the facilitator. Test, Weekly test, 10%. Examination, Final examination - 3 hours, 90%. The final examination will be weighted by the results of the group reports. See unit co-ordinator for further information.

VAM3111 DESIGN OF MECHANICAL SYSTEMS

Locations: Footscray Park.

Prerequisites:VAM2142 - MECHANICAL ENGINEERING DESIGN

Description: During this unit students will work as individuals and in groups to develop broad skills in designing a range of machine elements in mechanical engineering systems. It covers the following topics. Design of mechanical elements: Design of power screws and fasteners. Design of power transmission shafting, gears, cams and followers. Design and selection of rolling contact and journal bearings. Selection of chain drives, belt drives, clutches and couplings. Computer programming for the design of mechanical elements. Computer aided drawing software will also be used to generate solid models of mechanical elements.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students are expected to be able to: Apply fundamental mechanics and scientific skills to the design and selection of mechanical elements. Identify, formulate and solve engineering design problems in a systematic way. Use computing methods to solve mechanical engineering design problems. Work effectively as a member and/or leader of a team and to time manage multiple tasks 5. Use mechanical engineering design skills to solve real world design problems.

Class Contact: Sixty (60) hours comprising small group work, lectures, tutorials and workshops.

Required Reading:K. Nisbett & R. Budynas (2010) 9th metric Shigley's Mechanical engineering design. McGraw Hill.

Assessment: Assignment, Design Report (approx. 2500 words). Group submission., 30%. Presentation, Oral presentation (5 min per student). Group presentation. Assessed individually., 10%. Examination, End of semester examination (3 hours), 60%. Assignment assesses: All Learning Outcomes and Graduate Capabilities. Oral Presentation assesses: Learning Outcomes 4 & 5 and Graduate Capabilities 2, 3, 4 and 5. Exam assesses: Learning Outcomes 1, 2, 3 and 5 & Graduate Capabilities 1, 3, 4 and 5. .

VAM3112 ELECTRICAL ENGINEERING

Locations: Footscray Park.

Prerequisites:ENF1202 - ENGINEERING PHYSICS 2

Description: The unit aims to provide students with a sound knowledge of electrical circuits, circuit analysis techniques, transformers, motors, generators as well as digital electronic circuits. The unit is taught in two distinct parts by separate academic staff. Part A - Electrical Circuits. Part A begins with a revision of basic fundamentals including Direct-Current (DC) circuits. The concept of nodal-analysis (node-voltage method) for the analysis of DC circuits is introduced. The principle of Superposition, derivation of Thevenin and Norton equivalent circuits are discussed in detail as well as the maximum power transfer theorem. Alternating-Current (AC) circuits are explored and the analysis of these circuits using complex numbers is covered. Three-phase AC systems are studied and the concept of power factor correction is introduced. An overview of electrical transformers is given. Finally, DC and AC motors are examined as well as synchronous generators. Part B - Digital Electronics. Part B begins with a discussion of number systems including the binary system and hexadecimal numbers. Arithmetic operations and Boolean expressions and their reduction techniques are explored. The design of combinational digital circuits using NAND/NOR design techniques/gates, latches, and flip-flops is introduced and studied in detail. These are done through Karnaugh Maps and Boolean Algebra. Special emphasis is given to the study of sequential digital circuits and their design techniques. Finally, asynchronous and synchronous counter circuits, analogue to digital conversion and microprocessor interface devices are introduced

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Analyse and solve DC and AC circuits using a range of circuit simplification techniques and nodal analysis 2. Apply the Principle of Superposition to circuit analysis 3. Derive the Norton and Thevenin equivalents of complex circuits 4. Differentiate the concepts of frequency, impedance and admittance as they relate to AC circuits 5. Analyse balanced three-phase systems 6. Appraise the significance of transformers in electric circuits and how they operate, and perform transformer operational and performance calculations 7. Summarise the operational principles of motors and generators, and use their equivalent circuits. 8. Estimate the operating and performance characteristics such as power, torque, and efficiency of motors and generators using their equivalent circuits 9. Distinguish a range of number systems including the binary system, octal and hexadecimal systems. Convert between these different number systems 10. Identify different Logic Gates, truth tables and summarise their use 11. Develop and simplify Boolean expressions using Boolean laws and in sum of products and/or product of sums expressions from logic truth tables 12. Design and optimize combinational and sequential digital circuits using NAND/NOR design techniques 13. Design asynchronous counters for a given count sequence 14. Assess the significance of analogue to digital conversion in electronic circuits

Class Contact: Sixty (60) hours per semester comprising lectures/tutorials/laboratory work.

Required Reading: Tocci, R.J. & Widmer, W.D (2010). 11th edition. Digital Systems: Principles and Applications. Prentice-Hall Rizzoni, G (2006). 5th edition. Principles and Applications of Electrical Engineering. McGraw Hill.

Assessment: Test, 2 One-Hour Class Tests, 20%. Laboratory Work, 2 Laboratory Group Reports (1000 words each), 20%. Examination, 3-Hour Final Examination, 60%. Laboratory Work: Learning Outcomes 4, 5, 10, 11, 12, 13 and Graduate Capabilities 1,2,3,4, and 5. Tests: Learning Outcomes 1-5 and 9-12, and Graduate Capabilities 1,2,4 and 6. Examination: Learning Outcomes 1-14, and Graduate Capabilities 1,2,4 and 6.

VAM3121 THERMODYNAMICS 2

Locations: Footscray Park.

Prerequisites: VAM2112 - THERMODYNAMICS 1

Description: Gas power cycles - the Otto cycle, Diesel cycle, gas-turbine cycle, and jet-propulsion cycle. Vapor and combined power cycles - Rankine cycle, using reheat and regeneration to improve the efficiency of the Rankine cycle. Gas mixture, mass and mole fraction, and properties of gas mixtures. Air-conditioning, specific humidity and relative humidity, dew-point temperature, wet bulb temperature, psychometrics chart, human comfort and air-conditioning. Combustion, type of fuels, theoretical and actual combustion processes, enthalpy of formation and enthalpy of combustion, first-law analysis of combustion systems, adiabatic flame temperature.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Define the various cycles related to petrol engines, diesel engines, gas turbine, and jet engines and determine their performance;
- Define the various cycles related to steam power cycles and determine their performance in large power stations;
- Determine the various thermodynamic properties of mixtures;
- Describe basic concepts of air-conditioning, and determine the energy and mass balance in air-conditioning systems;
- Describe the basic concepts of combustion; determine the air to fuel ratio and flame temperture.

Class Contact: Sixty (60) hours for one semester comprising lectures and tutorial/laboratory sessions.

Required Reading: Comprehensive class, laboratory and activity notes. On-Line material; Cengel, Y. A. and Boles, M. A. 2008 6th Edition Thermodynamics- An Engineering Approach, McGraw Hill

Assessment: Test, Class test; calculations, sketches max. 1000 words, 10%. Test, Class test; calculations, sketches max. 1000 words, 10%. Laboratory Work, Laboratory on Air Conditioning; calculations, sketches max. 1000 words, 10%. Examination, Final, 70%.

VAM3122 FLUID MECHANICS 2

Locations: Footscray Park.

Prerequisites: VAM3131 - FLUID MECHANICS 1

Description: Brief review of conservation laws in integral form. Conservation equations in differential form (covering continuity and Navier-Stokes equations). Exact solutions. Wall bounded shear flows, boundary layers, pipe and channel flows. Free shear flows, jets and wakes. Introduction to turbulent flows. Measurements in fluid mechanics, error analysis.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Discuss conservation laws to differential form; 2. Think and reason with applied physics.

Class Contact: Sixty (60) hours for one semester comprising interactive lectures and tutorial/laboratory/discussion sessions.

Required Reading: White, F.M. 2008 6th edition Fluid Mechanics McGraw Hill.

Assessment: Portfolio, Portfolio, 100%. Portfolio consisting of 10% weekly assignments, two tests 10% each, two experiments with brief laboratory reports 10% each, and final examination, 50% (3hrs). The assignments and experiments to be chosen by students with guidance. The experiments can be carried out in groups of up to four, provided the reports identify individual contributions to the team. All reports to be submitted via turn-it-in. .

VAM3131 FLUID MECHANICS 1

Locations: Footscray Park.

Prerequisites: VAN2041 - THERMOFLUIDS

Description: Brief review of fluid statics. Flow properties. Dimensional analysis, dimensionless numbers and introduction to modelling principles. Conservation laws in integral form (Reynolds transport theorem). Conservation of mass, linear momentum and energy. Bernoulli's equation. Conservation of angular momentum. Basic hydraulic machinery. Measurements in fluid mechanics, error analysis.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe flow basics and conservation laws in integral form; 2. Think and reason with applied physics.

Class Contact: Sixty (60) hours for one semester comprising interactive lectures and tutorial/laboratory/discussion sessions.

Required Reading: White, F.M. 2008 6th edition, Fluid Mechanics, McGraw Hill.

Assessment: Portfolio, Portfolio, 100%. Portfolio consisting of 10% weekly assignments, two tests 10% each, two experiments with brief laboratory reports

10% each, and final examination, 50% (3hrs). The assignments and experiments to be chosen by students with guidance. The experiments can be carried out in groups of up to four, provided the reports identify individual contributions to the team. All reports to be submitted via turn-it-in.

VAM4021 COMPUTATIONAL MECHANICS

Locations: Footscray Park.

Prerequisites:VAM3022 Stress Analysis 2, VAM3072 Mechanical Vibration.

Description: Solid modelling: Bottom-Up and Top-Down approach. Formulation of Finite Element Problem using Total Potential energy and Element stiffness matrix. Structural Stiffness matrix. Solution techniques, error, convergence and stability. Static Stress analysis in elasticity. Mathematical modelling of dynamic systems. Transient and steady state analysis. Root locus analysis and control system design. Frequency response analysis. PID controls. Stability. Analysis and simulation of control design by MATLAB.

Credit Points:12

Class Contact:5 hrs of lectures and tutorials per week for 12 weeks, including computer based laboratory using software.

Required Reading: Lecture Notes.

Assessment: Assignment 1: Solid Modelling of a structure by ANSYS (2000-3000 words), 25%; Assignment 2: Stress Analysis by Finite Element by ANSYS (2000-3000 words), 25%; Assignment 3: Dynamics and Control of systems using MATLAB (2000-3000 words), 25%; Laboratory 1: 3-hour experiment in Automation and Control, Report of 2000-3000 words, 25%.

VAM4032 MECHANICAL ENGINEERING DESIGN 2

Locations: Footscray Park.

Prerequisites:VAM3111 - DESIGN OF MECHANICAL SYSTEMS

Description: This unit aims to broaden students' design skills in several areas of mechanical engineering and to further develop a range of more generic skills including teamwork and communication. Students will generally work in small design teams to carry out projects relating to introductory design for optimisation, graphical optimisation, analytical and numerical search methods, linear programming, design for quality and Taguchi principles,and experimental optimisation.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Formulate and solve standard optimisation problems.
- Solve design problems using graphical, analytical and numerical optimisation procedures.
- Identify a range of design for quality procedures and have the ability to solve problems related to quantifying quality in design, designing for quality, and design and assessment of experimental optimisation procedures.

Class Contact: This unit will be delivered in PBL mode, and will comprise 60 hours (5 hours equivalent per week) of sessions made up of lectures, workshops and student team work. In addition, students are expected to devote at least the same amount of time for private and/or group work on the design projects. The unit is worth 12 credit points.

Required Reading: Lamb, M. VAM4032 Lecture Notes.

Assessment: Assignment, 5 problem sets covering fortnightly activities. Solutions will be largely mathematical. Class time will be provided. Group (2-3) submission, 20%. Test, Mid semester test (2 hours). Short Answer , 30%. Examination, End of semester examination (3 hours), 50%. Assignments assess: All Learning Outcomes and Graduate Capabilities Test assesses: Learning Outcomes 1 & 2 and Graduate Capabilities1, 4 & 5. Examination assesses: All Learning Outcomes and Graduate Capabilities 1, 4 & 5. .

VAM4041 HEAT TRANSFER AND COMBUSTION

Locations: Footscray Park.

Prerequisites:VAM3041 Thermodynamics and Fluid Mechanics 1.

Description: Conduction: steady state conduction in simple geometries, extended surfaces, one-dimensional and two-dimensional steady state conduction, transient heat conduction, charts for transient heat conduction. Numerical solution of heat transfers. Finite difference representation.Convection: thermal boundary layer, laminar flow, Reynolds analogy, heat transfer in turbulent boundary layers. Forced convection inside tubes and ducts and over exterior surfaces. Heat exchangers. Natural convection - empirical correlations for various shapes.Radiation heat transfer: thermal radiation, blackbody radiation, radiation properties, shape factors, enclosures with black surfaces, enclosures with grey surfaces. Computer simulation of heat transfer using finite element software.Fuel analysis: proximate analysis, ultimate analysis. Basic combustion equations for solid, liquid and gases fuels. Heating values of various fuels. The theoretical and actual air to fuel ratios. Enthalpy of formation. First law analysis of the reacting systems. Adiabatic flame temperature. Entropy change of reacting systems. Second law analysis of reacting systems.

Credit Points:12

Class Contact:three hrs of lectures and two hrs of tutorials per week.

Required Reading: Kreith F. and Bohn, M.S, 1998, Principles of Heat Transfer, 6th Edition, Harper and Row; Cengel, Y. A. and Boles, M. A. 2002 Thermodynamics An Engineering Approach, 4th edn McGraw Hill; Glassman, I., 1996 Combustion, Academic Press.

Assessment: Assignment 1: based on weeks 1-6 (maximum 1500 words), 10%; Assignment 2: based on weeks 7-12 (maximum 1500 words), 10%; Test 1: based on weeks 1-6, 10%; Test 2: based on weeks 7-12 , 10%; Laboratory Program: based on weeks 1-10, 10%; three hour examination, 50%.

VAM4042 FLUID DYNAMICS

Locations: Footscray Park.

Prerequisites:VAM3041 Thermodynamics and Fluid Mechanics 2.

Description: An introduction to the power of computational fluid dynamics. Continuous equations and their discretised form. Solution of one-dimensional steady-state and transient diffusion problems. The Thomas algorithm. Generalisation to two- and three-dimensions. Difficulties inherent in dealing with advection, and an introduction to up-wind differencing and the power law methods. Advection and dispersion of scalar quantities. An introduction to commercial software that is based on the above fundamental principles.

Credit Points:12

Class Contact:two hrs of lectures and three hrs of tutorials per week.

Required Reading: Wesseling, P. (2000) Principles of Computational Fluid Dynamics, Springer-Verlag.

Assessment: Assignment 1: based on weeks 1-3, 15%; Assignment 2: based on weeks 1-6, 15%; Assignment 3: based on weeks 7-8, 20%; Assignment 4: based on weeks 7-12, 20%; Assignment 5: based on weeks 7-12, 30%.The assessment tasks will demonstrate that students are capable of presenting sustained intellectual arguments. Some of the arguments take the form of narratives, whilst some of the arguments will be intensely mathematical, but illustrative of the narratives. It is expected that the written work will be based on rational argument and it will not be based on dubious ways of knowing and epistemologies. It is anticipated that students will be able to celebrate the achievements of scientific method over primitive myths. Each assessment task will be 500-1000 words.

VAM4062 MANUFACTURING AND POLYMER TECHNOLOGIES

Locations: Footscray Park.

Prerequisites:VAM 2062 Materials and Manufacture.

Description: Selection of Materials for engineering design, manufacture and recycling. Recycling processes of materials. Mathematical modelling of metal casting processes. Introduction to polymer rheology and viscoelasticity. Application of rheology in mathematical modelling of polymer injection moulding, calendering and extrusion processes. Manufacturing techniques of composite materials. Energy analysis of materials/manufacturing cycle.

Credit Points:12

Class Contact:four hrs of lectures (common tutorials, site visits) and one hr of tutorials and laboratory classes per week.

Required Reading: Rojter, J. (2005), Fundamentals of Materials Technology, Victoria University. Class Notes; Rojter, J. (2005), Class Notes; Rojter, J. (2005), Manufacturing Materials: Part 1, Victoria University. Class Notes; Callister, W.D. Jr (2004), Materials Science and Engineering- An Introduction, John Wiley and Sons Inc; Higgins, R.A. (2005), Engineering Metallurgy, Edward Arnold; Kalpakjian, S. (2002), Manufacturing Engineering and Technology, Addison- Wesley.

Assessment: Test 1 in week 5, 10%; Test 2 in week 11, 10%; Laboratory Reports and Assignments. Students are required to achieve a minimum of 40% in these assessment tasks to successfully complete the subject.Assignments and laboratory reports have a limit of 2500 words (excluding diagrams, graphs, appendices and bibliography), 25%; three hour examination, 55%.

VAM4072 ADVANCED MECHANICS

Locations: Footscray Park.

Prerequisites:VAM4021 Computational Mechanics.

Description: Introduction. Review of MDOF system. Continuous system. Frequency response function of a MDOF system. Vibration testing: calibration, vibration tests by shaker, by impact hammer. Modal analysis by software ICATS. Modal analysis of a continuous system by Finite Element Modellling.Fundamental concepts of fracture mechanics: stress intensity factor, energy balance approach. Linear Elastic Fracture Mechanics and brittle materials. Elastic-plastic fracture mechanics and ductile materials. Application in fatigue fracture analysis. Crack modelling by finite element.

Credit Points:12

Class Contact:5 hours of lectures and tutorials per week for 12 weeks, including experiments and computer-based laboratory.

Required Reading: Lecture notes.

Assessment: Laboratory 1: three hour Vibration testing (report of 2000-3000 words), 20%; Laboratory 2: three hour Modal analysis by ICATS (report of 2000-3000 words), 20%; Assignment 1: Modal analysis by Finite Element (2000-3000 words), 20%; Assignment 2: Crack modelling by Finite Element Modelling (2000-3000 words), 20%; Assignment 3: J integral by finite element modelling (2000-3000 words), 20%.

VAM4082 AUTOMOTIVE ENGINES, ENERGY AND ENVIRONMENT

Locations: Footscray Park.

Prerequisites:VAM3041 Thermodynamics.

Description: Engine types and their operation. Engine design and operational parameters. Engine dynamics. Engine testing and control. Engine performance characteristics. Thermochemistry of fuel air mixtures. Ideal models of engine cycles. Air, fuel and exhaust flow. Gas exchange processes. Heat and mass transfer within the engine. Combustion is spark ignition and compression ignition engines. Pollutant formation and control. Engine friction and lubrication. Fuels and lubricants. Modelling engine flow and combustion processes.Available energy resources. Environmental impact of using fossil fuels. Alternative energy resources. Wind power. Basic acoustics. Human perceptions and noise criteria. Control of noise.

Credit Points:12

Class Contact:60 hours in one semester comprising lectures, tutorials and practical laboratory sessions.

Required Reading: Comprehensive class, laboratory, activity notes and On-Line materials; Ferguson, C. and Kirkpatrick A. (2001) Internal Combustion Engines - Applied Thermoscience, 2nd edition, Wiley (ISBN 0-471-35617-4); Heywood J.B. (1988) Internal Combustion Engine Fundamentals, McGraw Hill (ISBN 0-07-100499-8).

Assessment: Test 1: based on weeks 1- 6 (calculation, sketch and maximum 1500 words), 15%; Test 2: based on weeks 6-12 (calculation, sketch and maximum 1500 words), 15%; Written laboratory reports, assignment and presentation (calculation, sketch and maximum 2000 words), 20%; Final Exam: three hours, 50%.

VAM4092 TRANSPORTATION AND PACKAGING DYNAMICS

Locations: Footscray Park.

Prerequisites:VAM3972 Mechanical Vibrations

Description: Shock and vibration in transportation environment. Road?vehicle interaction. Fragility, critical element. Effect of shocks and vibration on critical element. Characterisation of product/package systems relevant to package protection functions. Measurement of hazards in distribution environment. Analysis of data from distribution environment. Analysis of shocks and vibration. Response to shock loading. Shock spectra. Damage boundary curve. Experimental assessment of fragility with shock machines. Experimental assessment of vibration transmissibility. Remote monitoring of shock and vibration data. Five?step method for design of protective packaging. Characterisation of packaging materials relevant to their protective functions. Principles of design of a product?package system. Performance testing of shipping containers and units. International standards for performance testing of shipping containers and units (ASTM, ISTA, ISO). Testing protocols. Equipment for implementation of performance testing

Credit Points:12

Learning Outcomes: Upon satisfactory completion of the subjects students should have a good understanding of key principles underpinning the design of protective packaging for transportation, be familiar with experimental techniques relevant to performance testing of packaging and be equipped with specialist knowledge relevant to seeking employment in this field.

Class Contact:60 hours in one semester comprising lectures, tutorials and practical laboratory sessions.

Required Reading: Brandenburg R.K. and Lee J.J-L. (2001) Fundamentals of Packaging Dynamics, L.A.B. Equipment Hanlon J.F., Kelsey R.J. and Forcino H.E. (1998) Handbook of Package Engineering, 3rd edition, Technomic Publishing (ISBN 1-56676-306-1)ASTM Standards

Assessment: Test 1 - 90 minutes based on weeks 1- 5A written laboratory report on package performance testing - calculations, figures and diagrams, discussion (max 1000 words) 15%Essay on an aspect of modern packaging/transportation technology (max 1500 words) and its oral presentation (10 minutes)20%Exam - 3 hours 50%

VAM4111 ADVANCED MECHANICS 1

Locations: Footscray Park.

Prerequisites:COMPLETION OF AT LEAST HALF OF ALL 3RD YEAR SUBJECTS AND ANY UNIT OF STUDY RELEVANT TO THE SELECTED TOPIC (TO BE DETRMINED BY TOPIC SUPERVISOR).

Description: Students will select one project from a list of advanced topics aligned with the engineering and research expertise of academic staff and learn in the PBL mode under advice of their academic mentors. The topics offered in this UoS will be of interest to local and/or international research community in fields such as: Automotive engines. Computational fluid dynamics. Energy, environment and sustainability. Design of distribution packaging. Design optimisation. Environmental shocks and random vibrations. Finite element analysis. Heat transfer. Manufacturing and polymer technologies. Modal analysis. Modelling and computer simulation. Signal analysis.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an established knowledge in a specialist aspect of a mechanical engineering discipline under the academic mentorship; 2.Work effectively as a member and/or leader of a team, and to time manage multiple tasks. 3. Produce technical reports and participate effectively in discussions and debates.

Class Contact: Sixty (60) hours for one semester comprising consultations, team workshops, seminars, oral presentations, and team project activities.

Required Reading: Journal and conference papers related to the literature review of projects.

Assessment: Report, Written report in Scientific Conference Paper format, 100%.

VAM4112 ADVANCED MECHANICS 2

Locations: Footscray Park.

Prerequisites:COMPLETION OF ALL 3RD YEAR SUBJECTS

Description: Students will select one project from a list of advanced topics aligned with the engineering and research expertise of academic staff and learn in the PBL mode under advice of their academic mentors. The topics offered in this UoS will be of interest to local and/or international research community in fields such as: Automotive engines. Computational fluid dynamics. Energy, environment and sustainability. Design of distribution packaging. Design optimisation. Environmental shocks and random vibrations. Finite element analysis. Heat transfer. Manufacturing and polymer technologies. Modal analysis. Modelling and computer simulation. Signal analysis. Topic selection must differ from the selection made for Advanced Mechanics 1.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Demonstrate an established knowledge of a specialist aspect of a mechanical engineering discipline under the academic mentorship; Work effectively as a member and/or leader of a team, and to time manage multiple tasks; Produce technical reports and participate effectively in discussions and debates.

Class Contact: Sixty (60) hours for one semester comprising consultations, team workshops, seminars, oral presentations, and team project activities.

Required Reading: Journal and conference papers related to the literature review of projects.

Assessment: Report, Written report in the format of a scientific conference paper, 100%.

VAM4121 FINITE ELEMENT ANALYSIS

Locations: Footscray Park.

Prerequisites:VAM2122 - STRESS ANALYSISVAM3072 - MECHANICAL VIBRATIONS

Description: Introduction in finite element method. Example of plane truss structure. Structural stiffness matrix. Finite element modelling: node-element generation, solid modelling, top-down and bottom up approach. Static stress and structural analysis. Solution method, convergence and stability. Dynamic analysis: linear modal analysis, non-linear transient analysis, harmonic analysis, random vibration analysis. Parametric Design Language. Optimisation

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Describe the fundamentals of Finite Element Method 2. Model and solve static, dynamic and non-linear problems of Mechanical Engineering by Finite element. 3. Apply Finite Element Method to advanced problems of design and optimisation and problems in other areas of Mechanical Engineering.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials, computer and software based laboratory.

Required Reading: Lecture Notes by Dr Danh Tran

Assessment: Assignment, Assignment 1, 10%. Assignment, Assignment 2, 15%. Assignment, Assignements 3, 4 and 5, 75%.

VAM4122 ENGINEERING DESIGN AND OPTIMISATION

Locations: Footscray Park.

Prerequisites:VAM3111 - DESIGN OF MECHANICAL SYSTEMS

Description: This unit aims to broaden students' design skills in several areas of mechanical engineering and to further develop a range of more generic skills including teamwork and communication. Students will generally work in small design teams to carry out projects relating to introductory design for optimisation, graphical optimisation, analytical and numerical search methods, linear programming, design for quality and Taguchi principles,and experimental optimisation.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Apply standard problem formulation for optimisation; Apply graphical, analytical and numerical optimisation procedures;   3.   Identify the concepts of : quantifying quality in design, designing for quality, and design and assessment experimental optimisation procedures.

Class Contact: Sixty (60) hours for one semester comprising sessions made up of lectures, design workshop / seminars and student team design work.

Required Reading: Semercigil, E., VAM4032 Lecture notes.

Assessment: Portfolio, Portfolio, 100%. The portfolio documents evidence that the learning outcomes have been achieved. The portfolio will normally include skills audit results and design reports including technical calculations, but may also include a reflective journal, workbook(s), and self and peer assessment Further details on portfolio components will be issued to students during the first week of classes.

VAM4132 ADVANCED ENGINEERING ANALYSIS

Locations: Footscray Park.

Prerequisites:VAM3072 - MECHANICAL VIBRATIONSVAM2131 - ENGINEERING ANALYSIS

Description: This Unit of Study introduces students to advanced methods of signal and system analysis and systematic analysis of behaviour of engineering systems, including their automatic control. It continues to expose students to generic analytical skills and methods relevant to contemporary engineering practice and illustrates practical applications in the analysis of various generic engineering systems. It covers the following topics: Instrumentation and sensors for mechanical processes. Data acquisition for signal and system analysis. Classification of signals. Digital signal processing. Signal noise minimisation techniques. Digital filters. Random signals. Signal statistical estimates. Advanced signal and dual channel system analysis in the frequency domain. Scaling of FFT spectra. Power Spectral Density. Measurement of Frequency Response Function (FRF). Bode and Nyquist plots. Spectral averaging. Auto- and cross spectra. The time domain equivalents: impulse response function, auto- and cross correlation, synchronous averaging. Coherence and signal-to-noise ratio. Simulation of dynamic response of systems using the FRF and transfer functions. Adaptive filters. Control system theory. Application of FRF in feedback control. PID control. Control system design. Stability. Root locus. Applications of advanced analysis in various branches of mechanical and civil engineering, such as: the measurement of structural modes and structural damping, the validation of results of Finite Element Method, the Noise-Vibration-Harshness analysis, analysis of noise contaminated signals, acoustic signals and sensor response, automatic feedback controllers.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Identify and perform digital signal processes relevant to mechanical and structural engineering; Identify and participate in measurement of Frequency Response Function, other aspects of dual channel analysis techniques of systems and their applications; Describe fundamentals of control theory; Work effectively as a member and/or leader of a team, and to time manage multiple tasks;   5. Produce technical reports and participate effectively in discussions and debates.

Class Contact: Sixty (60) hours for one semester comprising lectures, team project activities, field and laboratory experimentations and computer laboratories.

Required Reading: Randall R.B. (1987), Frequency Analysis. Bruel & Kjaer, Demnark. Dorf R.C. and Bishop R.H, (2004) 10th ed., Modern Control Systems, Prentice Hall

Assessment: Formative assessment in the form of group reports. These will be assessed as satisfactory (0) or unsatisfactory (1). Other, Progress quizzes and diary, 10%. Examination, Final. Weighted by the average score for group reports., 90%.

VAN1011 EXPERIMENTATION AND COMPUTING

Locations: Footscray Park.

Prerequisites: Nil.

Description: Experimentation and measurement: The use of instrumentation, laboratory and technical procedures, work-place safety requirements, report writing and oral presentation.Data analysis and presentation: Algorithm development, Introduction to Data types, Data file reading and writing, Graphing and analysis of experimental data, curve fitting. Statistical and error analysis of experimental data, Solutions of equations.

Credit Points:12

Learning Outcomes: Upon successful completion of this subject students will:

- be able to demonstrate engineering project and time management skills.
- have developed independent, self reflective learning and evaluation skills;
- be able to research and analyse engineering problems and identify a range of appropriate solutions;
- be able to demonstrate an ability to work effectively as a member of a team and to manage multiple tasks.
- have acquired skills and knowledge related to small and large scale measurements with use of instrumentation and laboratory equipment.
- have become familiar with laboratory procedures and work-place safety requirements, experimental techniques and methods of presentation.
- have demonstrated appropriate professional written and oral communication skills.
- have acquired skills in the analysis, simulation and presentation of engineering data measured in the laboratory, using computing techniques.
- be able to use the knowledge gained from this subject to conduct effective project-based, laboratory and measurement activities and report presentations for subjects at higher years of the course.

Class Contact:5 hrs equivalent per week of sessions made up of small group project work, team meetings, workshops, seminars and presentations. In addition, students are expected to devote at least this much time for private and/or group study.

Required Reading: Comprehensive project , laboratory and activity notes. On-line material.Kirkup, Les., 2001 'Experimental Methods - An Introduction to the Analysis and Presentation of Data', Wiley.Palm, William, J., 2001, 'Introduction to Matlab 6 for Engineers', McGraw-Hill.

Assessment: An individual portfolio which providesevidence that demonstrates that the learning outcomes have been achieved. The portfolio may include skills audits, project reports, reflective journals, workbooks,self and peer assessment.

VAN1022 SOLID MECHANICS 1

Locations: Footscray Park.

Prerequisites: Nil.

Description: Concept of force. Equilibrium of coplanar forces. Resultant forces, components of forces. Levers and moments. 2D statical equilibrium. Free body force diagrams. Pin jointed trusses. Beams, loads and reactions. Internal forces in beams. Bending moment and shearing force diagrams for beams. 3D statical equilibrium. Direct stress and strain. Elastic modulus. Simple bending stress and strain. Shear stress and strain. Shear modulus, Poisson's ratio.

Credit Points:12

Learning Outcomes: Upon successful completion of this subject, students will:

- have developed an understanding of forces and moments.
- be able to use Free Body Diagrams and equilibrium equations to determine forces and reactions of simple structural systems such as two-dimensional trusses and beams.
- have developed an understanding of sectional properties, of stress and strain, and of bending and shear stresses in beams.
- be able to think independently and develop and exercise imagination and insight to solve statically a given structure.
- have demonstrated an ability to work effectively as a member of a team, to write technical reports and to manage time effectively.
- be able to use the knowledge obtained from this subject to undertake later engineering subjects.

Class Contact:5 hrs equivalent per week made up of a mix of small group work, lectures, and workshops. In addition, students are expected to devote at least this much time for private and/or group study.

Required Reading:·Hibbler, R.C (2004), Statics and Mechanics of Materials, Fifth Edition - SI Units, Pearson International·University, "WebCT" web site for the subject.

Assessment: An individual portfolio which provides documented evidence demonstrating that the learning outcomes for the subject have been achieved. The portfolio will include two major parts: a skills audit and an assignment set which includes structural model making, drawings and project reports.

VAN1032 INTRODUCTION TO DESIGN

Locations: Footscray Park.

Prerequisites: Nil.

Description:the design process and the history of Engineering design creative thinking in design, generating and evaluating design alternatives technical, environmental, human, economic, legal criteria for evaluation of design alternatives making the final decision in design professional Engineering drawing practice, projections and views, dimensioning, layout, assembly, detailed drawings and sketching computer generated drawings utilizing the commercial industry standard software AutoCAD.

Credit Points:12

Learning Outcomes: Upon successful completion of this subject, students will:

- be able to identify apparent and real design problems and identify alternatives for a given design problem
- be able to evaluate various alternatives against various design criteria, such as environmental, economical, technical, human and legal
- be able to think independently and develop and exercise imagination and insight to solve a given engineering project
- have demonstrated an ability to work effectively as a member of a team, to write technical reports and to time manage multiple tasks
- have a sound understanding of graphic procedures appropriate to Engineering design and achieved a basic level of engineering graphic skills
- have demonstrated an appropriate level of professional written and oral communication skills
- be able to prepare and use computer generated drawings as a means of communicating Engineering design to others.
- be able to use the knowledge gained from this subject to conduct effective project-based, laboratory and measurement activities and report presentations for subjects at higher years of the course.

Class Contact:5 hrs equivalent per week made up of small group work, team meetings, workshops, seminars and presentations. In addition, students are expected to devote at least this much time for private and/or group study.

Required Reading: Fogler, H.S. and LeBlanc, S.E., 1995, Strategies for Creative Problem Solving, Prentice Hall PTR.

Assessment: An individual portfolio which provides documented evidence demonstrating that the learning outcomes for the subject have been achieved. The portfolio will include skills audits, design project reports, design drawings and models, reflective journals, design notebooks, self and peer assessment, oral presentations.

VAN1051 ENGINEERING PROFESSION

Locations: Footscray Park.

Prerequisites: Nil.

Description: This subject gives students an understanding of how society has developed as a result of science and engineering, exploring the need for and the responsibilities of the professional engineer. Professional written and oral communication skills, time management and teamwork skills, self reflection and evaluation skills will be developed in the context of engineering issues. Topics considered include the role of an engineer, ethics, approaches to problem solving and design, the environment and sustainable development. Content is divided equally between consideration of these engineering issues and the development of written and oral communication skills.

Credit Points:12

Learning Outcomes: Upon successful completion of this subject, students will:

- be able to make effective oral presentations;
- be able to produce written text in a variety of genres
- be able to articulate at a fundamental level the "language of engineering";
- have developed independent, self reflective learning and evaluation skills;
- have developed an understanding of the importance of science and engineering in a civilised society;
- have demonstrated a knowledge of appropriate ethical behaviour in professional engineers;
- be able to research and analyse engineering problems and identify a range of appropriate solutions;
- be able to demonstrate an understanding of environmental issues and sustainable development;
- be able to demonstrate an ability to work effectively as a member of a team and to manage multiple tasks;
- be able to demonstrate time management skills to complete a project in a specified time.

Class Contact:5 hrs equivalent per week of sessions made up of small group work, team meetings, workshops, seminars and site visits. In addition, students are expected to devote at least this much time for private and/or group study.

Required Reading: Engineering in Society 2006, Class Notes.VU, Faculty of Arts 2006, Handbook of Communication Skills for first year students in the Faculty of Science, Engineering and Technology, 7th edn.

Assessment: An individual portfolio which providesevidence that demonstrates that the learning outcomes have been achieved. The portfolio may include skills audits, project reports, reflective journals, workbooks,self and peer assessment.

VAN2021 SOLID MECHANICS 2

Locations: Footscray Park.

Prerequisites:VAN1022 - SOLID MECHANICS 1VAN1022 Solid Mechanics 1

Description: Properties of sections, including area, centroids, first and second 'moments' of area. Polar moment of area. Principal axes of sections. Parallel axis theorem. Deflection of simple determinate beams. Deflections by Macaulay's method and superposition. Failure modes and loads for compression members, includes squashing / elastic buckling and combined effect of direct and bending stresses. Stresses and strains in two dimensions, Mohr's circle, principal stress. Elastic bending stresses and shear stress distribution in beams. Unsymmetrical bending. Shear centre. Principal axes. Torsion in solid and thin-wall tubes. Open and closed sections. Simple frames under bending.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Calculate centroids, centre of gravity, moment of inertia for simple and composite elements;
- Calculate the deflection of beams;

- Calculate shear stresses in beams and sketch shear flow distribution;
- Define failure modes of compression members;
- Explain the concepts of principal stress and Mohr's circle;
- Describe twist and torsion in structures and determine shear stress and angle of twist in simple structures.

Class Contact: Sixty (60) hours or equivalent for one semester comprising of a mix of small group work, lectures, and workshops.

Required Reading: Hibbeler, R.C (2004) SI Units Statics and Mechanics of materials Pearson International Hibbeler, R.C (2008). Seventh (SI) edition Mechanics of materials Pearson international

Assessment: An individual portfolio which provides documented evidence demonstrating that the learning outcomes for the subject have been achieved. The portfolio will include two major parts: a skills audit and an assignment set which includes structural model making, drawings and project reports. Report, Based on PBL activites, 40%. Examination, Written - Closed book, 40%. Presentation, Oral, 10%. Test, Open book, 10%.

VAN2032 ENGINEERING DESIGN

Locations: Footscray Park.

Prerequisites:VAN 1022 Solid Mechanics 1

Description: The structural design covers: Static dead and live loads, The fundamental rationale in choosing design loads and the calculation of specific loads.Design of simple structural steel beams and columns. Design of bolted and welded connections in simple shear or tension.The mechanical design covers: Design uncertainties and reliability, Theories of Static Failure, Low and High cycle fatigue failure, Linear and torsional impact failure.Many of the topics will be related to case studies such as building components and mechanical elements.

Credit Points:12

Learning Outcomes: Upon successful completion of this subject students will be able to demonstrate:

- An understanding of the concepts for static and dynamic and structural actions.
- The ability to apply concepts in the appropriate determination of design loads to an introductory level.
- The ability to apply concepts in the design of simple structural and mechanical elements.
- The ability to critically evaluate the sensibility of design outcomes.
- The ability to present design outcomes in a professional manner.
- The ability within the context of the subject areas, to formulate and solve specific design problems.
- The ability to work both autonomously and as a member of a team, and effectively communicate design investigations by a variety of means.

Class Contact:5 hrs equivalent per week of sessions made up of small group work, team meetings, workshops, seminars and presentations. In addition, students are expected to devote at least this much time for private and/or group study.

Required Reading: Nil.

Assessment: An individual portfolio, which provides evidence that demonstrates that the learning outcomes have been achieved. The portfolio may include skills audits, project reports including technical calculations, reflective journals, workbooks, self and peer assessment.

VAN2041 THERMOFLUIDS

Locations: Footscray Park.

Prerequisites:ENF1202 - ENGINEERING PHYSICS 2

Description: Basic concepts of thermodynamics and fluid mechanics. Thermodynamic properties of gases, liquids and solids. The ideal gas law. Energy transfer by heat, work and mass. The first law of thermodynamics for closed and open systems. Fluid statics-forces on submerged planes, Archimedes' principle, and stability of floating bodies. Fluid dynamics - basic concepts of fluid flow. Continuity, momentum and energy equations in control volume forms. Application of these equations to pipe flows.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply basic concepts of Thermodynamics and Fluid Mechanics; 2. Determine phase changes of pure substances; 3. Use First Law of Thermodynamics to solve engineering related problems; 4. Calculate hydrostatic force on submerged bodies; 5. Use continuity, momentum and energy equations to solve engineering related problems.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and laboratory experiments.

Required Reading: Cengel, Y. A. and Boles, M. A. 2011 7th Edition Thermodynamics- An Engineering Approach McGraw Hill Hamill, I. 2001 2nd Edition Understanding Hydraulics Palgrave Presses White, F., 2010 7th edition Fluid Mechanics McGraw Hill Comprehensive class, laboratory and activity notes. On-Line material

Assessment: Test, Based on weeks 1-6 (45 minutes), 10%. Test, Based on weeks 6-12 (45 minutes), 10%. Laboratory Work, Assessment of experiment and report on Stability of Floating Body, 10%. Laboratory Work, Assessment of experiment and report on Tube and Shell heat exchanger, 10%. Examination, End-of-semester examination (3 hours), 60%. Test 1 assesses: Learning Outcomes 1,4,5 and Graduate Capabilities 1,2,3,4 Test 2 assesses: Learning Outcomes 1,2,3. and Graduate Capabilities 1,2,3,4. Laboratory Work 1 assesses: Learning Outcomes 1,4,5 and Graduate Capabilities 1,2,3,4,5,6 and is linked to 10% LiWC Laboratory Work 2 assesses: Learning Outcomes .1,2,3.. and Graduate Capabilities 1,2,3,4,5,6 and is linked to 10% LiWC Examination covers Learning Outcomes 1,2,3,4,5 and Graduate Capabilities 1,2,3,4,5,6.

VAN2061 ENGINEERING MATERIALS

Locations: Footscray Park.

Prerequisites:VAN1022 Solid Mechanics 1 and REP1001 Engineering Physics 1A.

Description: Atomic structure and bonding. Prediction of properties of materials. Chemical stoichiometry and application of mass balances in chemical processes in environment and manufacturing. Extent and speed of reactions incorporating rate laws and Arrhenius theory and their applications to materials science, automotive engineering, civil engineering and biochemical reactions. Reactions involving thermal and electrical energy production and their application to fuel technology and fuel cells. Corrosion and corrosion protection of metals. Processes of polymer, aluminium, steel and copper production.Introduction to microstructure and crystallography of materials and their effect on material properties. Formation of metal grains and casting processes. Dislocation theory and strengthening processes in metals. Introduction to metal alloys and phase equilibria and phase equilibrium diagrams. Phase diagrams and microstructures of plain carbon steels and cast irons. Construction of TTT curves and their application to heat treatments of plain carbon steels and cast irons.

Credit Points:12

Learning Outcomes: Upon successful completion of this subject, students will be able to demonstrate:

- An understanding of processes and key issues related to engineering science in manufacturing and environment.
- An ability to solve a range of numerical engineering problems found in engineering practice and engineering design.
- An ability, within the context of the subject areas above, to find and use relevant information, to formulate and solve specific problems, to work both autonomously and as a member of a team, to effectively communicate ideas, issues, investigations and results by a variety of methods, and to work in culturally diverse settings.

Class Contact: 5 hrs equivalent per week of sessions made up of small group work, team meetings, workshops, seminars, laboratory sessions and site visits. In addition, students are expected to devote at least this much time for private and/or group study.

Required Reading: Rojter, J. (2005), Fundamental Applications of Science to Materials Technology, Victoria University.Class Notes.Rojter, J. (2005), Structure and Mechanical Properties of Solids1, Victoria University. Class Notes.Zumdahl, S.S., and Zumdahl, A.S (2003), Chemistry, 6th Ed, Houghton Mifflin Company.Callister, W.D. Jr (2004), Materials Science and Engineering- An Introduction, John Wiley and Sons Inc.

Assessment: An individual portfolio which providesevidence that demonstrates that the learning outcomes have been achieved. The portfolio may include skills audits, laboratory reports, site visit / project reports, reflective journals, workbooks, self and peer assessment.

VAN3052 ENGINEERING MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: Role and responsibilities of engineering managers in the industry. Principles of engineering management. General management principles and engineers as managers. Introduction to network planning, critical path analysis, resource allocation and the management of a development project. Feasibility studies and project evaluation. Economic analysis of engineering projects. Financial modelling of engineering systems. Strategies for plant selection. Planning and scheduling techniques for engineering projects. Tools for project control. Planning techniques for repetitive construction or production. Optimising resources and trend monitoring. Management of the development process using a computer package.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Prepare a plan, prepare network logic diagrams, determine critical paths and optimise project resources; 2. Apply the time value of money concepts for the economic evaluation of engineering systems or projects; 3. Apply general management principles for the successful delivery and management of engineering projects; 4. Use commercially available software, such as Microsoft Project and Microsoft Excel, as time management and economic analysis tools.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and computer laboratories.

Required Reading: Leland Blank & Anthony Tarquin, 2007 Engineering Economy Antill J.M., 1999 3rd ed. Antill's Engineering Management Wiley Rory Burke, 2005 Project Management: Planning and Control Techniques

Assessment: Test, Class tests and assignments, 40%. Examination, End-of-semester examination, 60%.

VAN4011 ENGINEERING PROJECT 1

Locations: Footscray Park.

Prerequisites: VAN3052 - ENGINEERING MANAGEMENT

Description: This unit constitutes a major capstone task for the engineering courses listed above, and provides students with the opportunity to integrate and further develop a range of technical and generic skills acquired in earlier course years. It will typically expose students to industry practice or the research approach and will involve: preliminary investigation followed up by explicit formulation of an engineering-related problem, review of relevant literature and/or discussion with a range of stakeholders, critical analysis of the problem, development/testing of a range of possible alternative solutions, and evaluation of these against social, environmental and economic criteria prior to selection of a 'best' solution. Students are also required to undertake a number of activities aimed at improving their communication and project management skills. This project will normally be continued in VAN4012, semester 2.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply engineering knowledge, problem solving and project management skills learnt from the course; 2. Demonstrate resourcefulness, creative approach and ability to generate ideas utilising information pertaining to a broad range of topics relevant to the project; 3. Formulate, plan, design and/or construct and test solutions for an engineering problem specific to their chosen discipline; 4. Demonstrate skills in working with technical support staff, fellow students, and industry and/or community representatives and reflect on own and others' environmental, social and cultural practices; 5. Critically evaluate and respond to own and others' performance using established parameters.

Class Contact: Sixty (60) hours per week comprising supervised and unsupervised sessions made up of individual or small group work, team meetings, seminars, practical work and site visits.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Portfolio, Project Participation, 85%. Presentation, Oral, 15%. The portfolio will typically be based on individual project participation (which may be demonstrated by a project reflective journal plus peer group and staff observations) .

VAN4012 ENGINEERING PROJECT 2

Locations: Footscray Park.

Prerequisites: VAN4011 - ENGINEERING PROJECT 1

Description: This unit constitutes a major capstone task for the engineering courses listed above, and provides students with the opportunity to integrate and further develop a range of technical and generic skills acquired in earlier course years. It will typically expose students to industry practice or the research approach and will involve: preliminary investigation followed up by explicit formulation of an engineering-related problem, review of relevant literature and/or discussion with a range of stakeholders, critical analysis of the problem, development/testing of a range of possible alternative solutions, and evaluation of these against social, environmental and economic criteria prior to selection of a 'best' solution. Students are also required to undertake a number of activities aimed at improving their communication and project management skills. (The project work undertaken here will normally be a continuation of that carried out in VAN4011.)

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply engineering knowledge, problem solving and project management skills learnt from the course; 2. Demonstrate resourcefulness, creative approach and ability to generate ideas utilising information pertaining to a broad range of topics relevant to the project; 3. Formulate, plan, design and/or construct and test solutions for an engineering problem specific to their chosen discipline; 4. Apply skills in working with technical support staff, fellow students, and industry and/or community representatives and reflect on own and others' environmental, social and cultural practices; 5. Critically evaluate and respond to own and others' performance using established parameters.

Class Contact: Sixty (60) hours for one semester comprising of supervised and unsupervised sessions made up of individual or small group work, team meetings, seminars, practical work and site visits.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Portfolio, Project Participation, 75%. Presentation, Oral and Project, 25%. The portfolio will typically be based on individual project participation (which may be demonstrated by a project reflective journal plus peer group and staff observations). .

VAN4051 ENGINEERING PROJECT MANAGEMENT

Locations: Footscray Park.

Prerequisites:VAN3052 - ENGINEERING MANAGEMENT

Description: The role of engineering project management in the industry. Roles of Project Managers. Principles of project management. Nine areas of Project Management Body of Knowledge and five processes (PMBoK). Tendering process, strategies and practices. Forms of engineering, construction and project management contracts. Contract administration phases. Cost management systems for the progressive cost control of a project. Plan site administration of medium sized projects. Financial feasibility for long-term development projects; break-even analysis; engineering project evaluation; preparation of project cash flow; current engineering industry practices. Understand various forms of project delivery methods. Developing quality management system. Developing quality assurance process; measuring process performance; feedback and corrective action; responding to external changes; alternative approaches to total quality management. Identifying required resources - in terms of human, equipment and materials; understanding needs versus wants; selecting and apportioning in a resource limited situation. Managing through people; motivation; use of power; management styles; effective project communication; non-adversarial approach to people management; role of unions and employer organisations in an engineering industry; legal aspects relating to contracts, responsibility and liability of a manager running a small engineering company. This unit includes a mandatory series of lectures on professional conduct and ethics.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply the nine areas of project management body of knowledge and five processes in engineering projects; 2. Demonstrate project cash flows and budgets with respect to project control at various stages of the projects; 3. Undertake preliminary financial feasibility studies of engineering facilities; 4. Participate effectively as a member of a multi-discipline project control group; 5. Demonstrate and implement quality management system in an engineering industry or an engineering project; 6. Describe the role of unions and employer organisations in an engineering industry; 7. Identify resource conflicts and resolve them; 8. Describe the processes involved in running a successful engineering business. 9. Demonstrate proper and ethical professional conduct.

Class Contact: Sixty (60) hours for one semester comprising of lectures, workshops and computer laboratories.

Required Reading: Kerzner H., 2001 10th Ed. Project management:a systems approach to planning, scheduling, and controlling John Wiley Meredity and Mantel 6th Ed. Project Management - A Managerial Approach John Wiley

Assessment: Portfolio, Portfolio, 100%. The portfolio may include calculations, site visit reports, a reflective journal, workbook(s), self and peer assessment, skills audit tests, tests/exams, assignment/project reports. Further details on portfolio components will be issued to students during the first week of classes. .

VAR2001 MECHATRONICS 1

Locations: Footscray Park.

Prerequisites:VAR1001 Robotics 1.

Description: Co-ordinate and measurement systems, actuator and control systems, application of kinematics and dynamic concepts, trajectory planning and control, electronic and mechanical devices, sensors and instrumentation, application of power motors, actuators and transmission devices.

Credit Points:12

Class Contact: Three hrs of lectures and two hrs of tutorials per week.

Required Reading: John J. Craig, Introduction to Robotics: Mechanics and Control: International Edition, Prentice Hall, 2004.

Assessment: Laboratory report #1, 5%; Laboratory report #2, 5%; Laboratory report #3 , 5%; Assignment (maximum 1500 words), 10%; Mid-semester test, 10%; Tutorial presentation , 5%; three hour examination, 60%.

VBG873 MECHANICS OF MACHINES 1

Locations: Sunshine.

Prerequisites: Nil.

Description:MECHANICS OF MACHINES 1

Required Reading: No Required Reading

VBG874 MECHANICS OF MACHINES 2

Locations: Sunshine.

Prerequisites: Nil.

Description:MECHANICS OF MACHINES 2

Required Reading: No Required Reading

VBG877 THERMODYNAMICS 3

Locations: Sunshine.

Prerequisites: Nil.

Description:THERMODYNAMICS 3

Required Reading: No Required Reading

VBG879 INDUSTRY RESEARCH PROJECT

Locations: Sunshine.

Prerequisites: Nil.

Description:INDUSTRY RESEARCH PROJECT

Required Reading: No Required Reading

VBN782 PERFORM BASIC WELDING AND THERMAL CUTTING PROCESSES TO FABRICATE ENGINEERING STRUCTURES

Locations: Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to perform:- basic welding using manual metal arc welding (MMAW)- basic welding using gas metal arc welding (GMAW)- basic thermal cutting using fuel gas equipmentThis involves identifying the welding/cutting requirements, preparing materials and equipment, welding and cutting components. Welding is routine and where the welding quality is not required to meet an Australian Standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Thermal cutting is manual straight line cutting.

Required Reading:-

Assessment: The following methods may be used in assessing units: Written objective tests; written responses; short and extended answers; oral test/technical interview; on job or workplace assessment; practical/exercises; practical projects; assignments; personal appraisal; verbal assessment; profiling.

VBQU467 SET UP ELECTRONICALLY CONTROLLED ROBOTICALLY OPERATED COMPLEX SYSTEMS

Locations: Sunshine, Off-shore.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to set up, adjust, maintain and modify electronically controlled robotically operated complex systems. This includes working safely; applying knowledge of both electronic control and robotic components to set up an integrated system, collecting and analysing data, problem solving and documenting set up and modification.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

VBQU469 SET UP ELECTRONICALLY CONTROLLED MECHANICALLY OPERATED COMPLEX SYSTEMS

Locations: Sunshine, Off-shore.

Prerequisites: Nil.

Description: The unit applies to engineering, manufacturing or processing environments, where electronically controlled mechanical systems are used and where this equipment requires setting up, adjustment, maintenance or modification.

Required Reading:VU Produced Workbooks

Assessment: Assessment tasks will be designed to reinforce and extend knowledge and skill competence within set and controlled parameters in accordance with each competency unit's learning outcomes and performance criteria requirements, including the setting of project and work based practical application tasks designed to provide evidence of competence outcomes, within periodic and scheduled timelines.

VCC8001 RESEARCH THESIS FULL TIME

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit will enable students to: identify a research problem and critically review the relevant literature; determine appropriate methods to study the problem; collect, and analyse data, and generate results using suitable statistical and analytical techniques; draw conclusions, critically evaluate the process undertaken and make recommendations for future research and for practice; present the results of the research undertaken, both clearly and accurately in a written thesis. The research topic chosen will allow the candidate to develop a methodology and to apply it to an appropriate problem or situation. The thesis will normally be from 15,000 to 25,000 words. It will report on independently conducted research which demonstrates the student's ability to clearly define a problem, to undertake a detailed literature search and review the literature on the topic area. The student shall also demonstrate both the ability to develop and/or apply models to study the problem and good data selection, collection and analysis skills. Students will normally be supervised by an academic member of the Department of Civil and Building Engineering and by a joint supervisor external to the Department. The external supervisor will be an academic from another Department of Victoria University or from another institution or an industry practitioner.

Credit Points:48

Class Contact: Twelve hours per week for one semester.

Required Reading: To be advised by lecturer.

VCC8002 RESEARCH THESIS FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:48

VCC8011 RESEARCH THESIS (PART-TIME)

Locations: Footscray Park, Off-shore, This unit is also available off-campus..

Prerequisites: Nil.

Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.

Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem 3. expert cognitive, technical and creative skills to:

- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature

4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for

external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8. autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the College and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

VCC8012 RESEARCH THESIS (PART TIME)

Locations: Footscray Park, This unit is also available off-campus..
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points:24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem 3. expert cognitive, technical and creative skills to:

- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature

4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8. autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Required Reading: To be determined in consultation with the supervisor.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the College and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

VCP5705 PROJECT MANAGEMENT AND INFORMATION TECHNOLOGY

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit will develop students' skills in the use of a number of software packages in the areas of General Project Management Information Systems and Specialised Project Management Information Systems. Students will gain appreciation of where computer packages can aid the project management process for feasibility and sensitivity analysis, planning and monitoring and information processing and decision support functions. The subject content includes the decision to computerise, hardware and software procurement considerations, current computer usage in this industry; overview of computer hardware and software, current computer trends; overview of Project Management Information Systems (spreadsheet/financial modelling, planning and resource control, Data Base Management Systems (DBMS), and Risk analysis); detailed investigation of at least two software packages from item above; managing change and introduction of computers, the machine/human interface, training and installation problems and opportunities simulation modelling as an alternative to traditional, activity based management systems; trends in CAD/CAM and its impact on Project Management; quality control and Project Management Information Systems.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Identify hardware and software relevant to the project environment; 2. Integrate the nine areas of project management body of knowledge and five processes in development projects; 3. Select appropriate project management software to develop project cash flows and budgets with respect to project control at various stages of the projects; 4. Develop a baseline plan and monitor progress by the use of a software for the delivery of a project; 5. Evaluate and assess various risks on development projects; 6. Deal with resource conflicts and be able to resolve them by the use of software; 7. Participate effectively as a member of a multi-discipline project planning control group.
Class Contact: Thirty six (36) hours for one semester comprising of lectures/seminars and computer laboratory sessions.
Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.
Assessment: Assignment, Individual assignment, 15%. Assignment, Group assignment presentation, 5%. Report, Semester report, 40%. Examination, End-of-semester examination, 40%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available. .

VCP5716 PROJECT DEVELOPMENT

Locations: Footscray Park.
Prerequisites: Nil.
Description: The unit will develop skills and techniques to asses and manage building property and to appreciate the role and objectives of developers and property

managers. Subject content examines Management of property in the economy: An overview: typology of property relationship between project management and Property Management. Feasibility and economic issues in development of property: Elements of a property development feasibility study. Parameters of property investment. Decisions including market analysis and financial evaluation techniques. Property investment criteria and considerations. Management of the development process (a client perspective): client briefing; formation of project team; design management, construction and financial management, project marketing. Financial feasibility - Case study and methods of evaluation. Law and property management - Strata titles; standard mortgage clauses; standard lease agreements. Land valuation and techniques for valuing property. Market survey and predictions - impact of macro-economic conditions on decisions to develop; marketing of space. Sources of finance, taxation, cash flow and forms of ownership. Management of leasehold, rental and home unit properties. Shopping centre development and management. Computer applications on financial feasibility analysis. Insurance, obsolescence, maintenance and replacement considerations.

Credit Points:12

Class Contact: Three hours per week for one semester.

Required Reading: To be advised by lecturer.

Assessment: Assignments, 15%; group project, 45%; examination, 40%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

VCP5726 PROJECT PROCUREMENT MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit will develop an understanding of procurement systems and modern building technology with respect to procurement options available to project sponsors including build-ability and use-ability issues: The subject content provides an overview of procurement systems and modern technology and the problems that have arisen from it, the lessons to be learned from them and how to try and avoid similar pitfalls in the future. Forms of traditional and non-traditional procurement options such as D&B, GMP, BOO/BOT. Modern building materials and the problems that are being encountered in their use, including concrete, cement sheet, brickwork, etc. Building materials and their modern usage, including aluminium, steel and plastics; looking at usage and cost considerations. Modern formwork systems. Fire protection approach to building. On-site considerations. Materials handling - cranes, hoists, concrete control, concrete pumping and mix design criteria, safety factors and cost implications. Modern construction techniques.

Credit Points:12

Class Contact: Three hours per week for one semester.

Required Reading: To be advised by lecturer.

Assessment: Assignments, 15%; group project, 45%; examination, 40%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

VCP5736 FACILITY LIFE CYCLE COSTING

Locations: Footscray Park.

Prerequisites: Nil.

Description:A description of and the need for consideration of lifecycle costing; maintainability and efficiency. Terotechnology: why we need to use terotechnology in building industry; economic and technical factors - measures of performance; present state of knowledge. An integrated treatment of design, specification, construction use, maintenance and re-use phases for building and the effect on the life-cycle costs of the building. Discounting theory. Time value of money; discounting formulae; inflation; depreciation, taxation; before and after-tax project return; evaluation methods for economy studies. Theory of life-cycle cost optimisation. Basis of theoretical analysis of costs; total life-cost concepts; maintenance costs and capital costs; energy costs and capital costs; taxation and other factors; constraints; technical and others. Practice of life-cycle cost optimisation. Case study; practical issues; introduction; outline of factors to be considered in building obsolescence and refurbishment; market aspects; physical aspects and limitations; authorities and regulatory constraints; economic constraints. Measurement and the assessment of utilisation of resources during each phase of the building process. Design phase (including brief documentation); construction phase; functional (occupational) life; re-evaluation as to refurbish or demolish phase. Asset management using an integrated planning and budgeting approach. Need for an integrated system; provision of funds at regular intervals and/or in emergency situations; fabric of building and other services; total assets management; case-studies - Latrobe system, others. Operational control. Control systems; identification of effective, preventive and remedial measures. Establishment of a maintenance policy. Preventive maintenance; corrective maintenance; records and register for maintenance as a control tool; accounting and costs records and audits. Degradation of buildings. Identification of maintenance approaches for building structure, fabric, equipment and plant; nature and causes of degradation. Information and management systems. Building services supervisory system; description Local Monitoring and Control Systems (LMCS); Central Supervisory Systems (CSS). Building engineering services information and management systems; functions; commercially available packages; selection, evaluation of benefits. Case study presentation and review.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Understanding of life cycle costing theory, terminology, relevance to simple and complex assets, facilities, benefits, total asset management concepts; 2. Address relevant issues including functionality, standards, asset accounting, relevant economic parameters, return on investment, and measures of worth; 3. Apply theory to simple and complex assets, with and without inflation, depreciation and taxation considerations, choice of alternative asset solutions; 4. Apply theory of facility management, policy formation, information systems, operations and maintenance; 5. Produce life cycle cost evaluations of commercial income-producing facilities including written and oral presentations of results as though to a client.

Class Contact: Thirty six (36) hours for one semester comprising – lectures, computer laboratory sessions, seminars and workshops.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Assignment, Individual assignment, 20%. Project, Group project, 40%. Examination, End-of-semester examination, 40%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

VCP5745 BUILDING REGULATORY MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit will develop a suitable background and understanding of by-laws and regulations that apply to building activities in Victoria. Subject content includes authorities controlling building activities; role and function of the building surveyors; contents and interpretation of various by-laws and regulations governing building activities such as: Local Government Acts, Building Code of Australia, Water and Sewerage Acts, Health Act, Labour and Industry Act, Lifts and Crane Act, Scaffolding Act, Environmental Protection Act, By-laws governing fire protection, Strata and

Cluster Titles Act, Housebuilder's liability, Land use and development strategy, Guide to administrative procedures, Planning guidelines, Townscape and heritage considerations, Checklist of requirements in a major development, The role of various professional disciplines. General introduction to BC Act. Definitions. Relationship to other Acts, new Acts. Building Approvals process. Introduction to BCA, Part A. Classes of buildings Parts C, D, F and G. Accreditation: Protection of adjoining property. Enforcement. BCA and plan check. Fire as hazard to life and property. Overview of current knowledge in fire start and spread in buildings. Overview of fire safety and regulations in Australia; current practices in regulation and building control; fire safety in new proposed Code. Overview of planning schemes in Victoria. Need for a Uniform Planning Scheme; need for optimisation of planning process. Local Government planning officials' views on a rational new system; industry perception of the planning system's current operation; possibility of planning being accomplished by certification. International - scene and practice - what can we learn from it.
Credit Points:12
Class Contact: Three hours per week for one semester.
Required Reading: To be advised by lecturer.
Assessment: Assignments, 20%; examination, 70%; class participation, 10%. Students must attain a mark of 50% in each assessable component to pass this subject. Supplementary assessment will not be available.

VEA2101 INTRODUCTION TO COMPUTER CONTROL AND AUTOMATION

Locations: Footscray Park.
Prerequisites:VEF1002 - ENABLING SCIENCES 1B
Description: Programmable Logic Controllers: Introduction to PLCs, programming and application. Introduction to Digital Control: Control loops, Process responses, PID algorithm. Loop tuning. Sensors and Actuators: Resistive, inductive, capacitive, photo-electric, Stepping Motors, Solenoids and applications. Analog to Digital Conversion, Digital to Analog Conversion and Signal Conditioning Circuits.
Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- program PLC;
- apply PID algorithm to effectively control a system;
- use appropriate sensors and actuators in an engineering setting;
- use A-to-D and D-to-A for interfacing.

Class Contact:30 hours of contact for one semester comprising 20 hours of lectures/tutorials and 10 hours of laboratory sessions.
Required Reading: Ng, Y. (Ed.). (2008). Class notes (Rev. ed.). Footscray, Australia: Victoria University, School of Electrical Engineering.
Assessment: Laboratory Assignments (30%); Tests (10%); Examination (60%).

VEA2102 INDUSTRIAL CONTROL SYSTEMS AND ELECTRONICS MANUFACTURING AUTOMATION

Locations: Footscray Park, Pre-requisite(s) VEA2101 Introduction to Computer Control and Automation.
Prerequisites: Nil.
Description:SCADA : Concepts, Human Interface, Remote Terminal Unit, Master Station, Communication Infrastructure, Controller Area Network, Machine to machine communication, Security. System Design and Implementation. Electronics Manufacturing: PCB Design, Routing, Components Placement, Signal Integrity, Electromagnetic Compatibility, Design for Manufacturing, Schematic and Netlist, Library, Components and Data Sheets.
Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- explain SCADA systems and its components as well as being able to design a SCADA system for a simple manufacturing plant;
- explain the whole electronics manufacturing process in general and PCB design and production in particular;
- design a PCB for a given electronic circuit that could be produced in volume by outsourcing to other companies.

Class Contact:30 hours of contact comprising 18 hrs of lectures/tutorials and 12 hours of laboratory sessions.
Required Reading: Ng, Y. (Ed.). (2008). Class notes (Rev. ed.). Footscray, Australia: Victoria University, School of Electrical Engineering.
Assessment: Laboratory Assignments (50%); Tests (10%); Examination (40%).

VEA3001 INTRODUCTION TO CONTROL SYSTEMS A

Locations: Footscray.
Prerequisites:VEF2002 Systems and Mathematics 2B
Description: The unit is designed to enable it to both ensure that students develop an understanding of Control Engineering, and to provide support for students requiring knowledge of Control Engineering in a concurrently studied PBL unit. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the subject will incorporate laboratory exercises and demonstrations of the concepts and techniques presented. Although primarily concerned with continuous time systems, lectures on discrete time systems may be delivered should these be required for the concurrent Engineering Design exercises.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- To have a basic understanding of the use of transfer functions, signal flow graphs and block diagrams in the description and analysis of control systems
- To appreciate the difference between real systems and the models of these systems.
- To be aware of the limitations of simulation software. To be able to write a quantitative specification of system performance.
- To be able to use Root Locus Techniques and Matlab to analyse the performance of LTI SISO system models.
- To be able to design P, PI, PID, lead, lag and lead-lag controllers to modify the behaviour of a LTI SISO model.
- To have an introductory knowledge of state-space models.
- To be able to calculate an overall transfer function by use of both Mason s Gain Formula and Block Diagram Reduction
- To be able to use Matlab/Simulink to analyse the behaviour of LTI SISO systems (including use of LTI viewer and rltool).

Class Contact:30 hours of class contact per semester. 2 hours lecture/tutorial and 0.5 hours of laboratory exercises per week.
Required Reading: Ives, R., Introduction to Control Systems 3B Lecture Notes, Victoria University, 2008.
Assessment: End of semester examination 65%, mid-semester test 15%, and laboratory 20%.

VEA3002 INTRODUCTION TO CONTROL SYSTEMS B

Locations: Footscray.
Prerequisites:VEA3001 Introduction to Control Systems A
Description: This unit of study further develops the student's knowledge of Control Systems and Control Engineering. The unit is designed to enable it to both ensure that students develop an understanding of Control Engineering and to provide support for students requiring knowledge of Control Engineering in a concurrently studied Engineering Design unit. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- To be able to write and execute C programs on the DSpace DS1102 card to both control and monitor a DC motor servomechanism.
- To be able to operate the DS1102 system using both the Control Desk GUI and through Matlab/Simulink.
- To understand how execution time impacts upon and limits the ability to achieve real time control.
- To be able to convert between State-Space and transfer function models of a LTI SISO system.
- To understand that State-Space models enable the representation of internal signals, and may be used to model MIMO systems.

Required Reading: Ives, R., Introduction to Control Systems 3B (Real Time Control) Lecture Notes, Victoria University, 2009.
Assessment: End of semester examination 65%, a mid-semester test 15% and laboratory 20%.

VEA4001 DISCRETE TIME CONTROL SYSTEMS A

Locations: Footscray.
Prerequisites:VEA3001 Introduction to Control Systems A
Description: This unit of study further develops the student's knowledge of Control Systems and Control Engineering and to provide support for students requiring knowledge of Computer Controlled Systems in a concurrently studied Engineerung Design unit. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent PBL exercises. In addition to delivery by lecture and tutorial the subject will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- To have a basic understand of the use of pulse transfer functions in the description and analysis of computer controller systems.
- To be able to convert a continuous-time transfer function model into a zero-order hold equivalent pulse transfer function model.
- To be able to convert between pulse transfer function models and difference equation models.
- To be able to perform analysis and design of discrete-time control systems with the Root Locus method.
- To be able to perform analysis and design of discrete-time control systems with the use of Bode diagrams in conjunction with the Bilinear transformation.
- To understand the need of performance trade-off in control design problems.
- To be able to use MatLab/Simulink to analyse and design discrete-time control systems.
- To be able to use the DSpace DS1102 DSP card and Real-Time Workshop for rapid prototyping.

Class Contact:30 hours of class contact. 2 hours lecture/tutorial and 0.5 hours of laboratory exercises per week
Required Reading: Ogata, K., Discrete-Time Control Systems, Prentice-Hall, 1995.
Assessment: End of semester examination 65%, a mid-semester test 15% and laboratory 20%.

VEA4200 FUZZY CONTROL AND APPLICATIONS

Locations: Footscray Park.
Prerequisites:VEA3001 Introduction to Control Systems A.
Description: Introduction to fuzzy sets theory: vagueness and uncertainty formalisation problem, fuzzy sets theory and probability theory comparison and discussion, fuzzy set definitions, properties of fuzzy sets, operations on fuzzy sets.Fuzzy relations: classical relations, fuzzy relations, operation on fuzzy relations, the extension principal. Natural language formalisation and approximate reasoning: linguistic variables, fuzzy propositions, fuzzy if - then statements, inference rules.Theoretical fundamentals of fuzzy control: the structure of a fuzzy controller, the rule base, the data base, the inference engine, choice of fuzzification and defuzzification procedures. Software and hardware tools for fuzzy control. Fuzzy controller design using software packages. Fuzzy controller implementation. Applications of fuzzy control.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent PBL exercises. On successful completion of this unit, it is expected that students will be able:

- To be able to understand the basic mathematical concepts of fuzzy sets.
- To be able to understand the structure of fuzzy logic controller.
- To be able to design and implement fuzzy logic controller.
- To be able to use MatLab/Simulink to analyse and design fuzzy control systems.

- To be able to use the DSpace DS1102 DSP card and Real-Time Workshop for rapid prototyping of the fuzzy control systems.

Class Contact:30 hours comprising 15 hours of lectures/tutorial and 15 hours of laboratory and project work.
Required Reading:K.M. Passino and S. Yurkovich , Fuzzy Control, Addison-Wesley, 1998. Free downloads from http://www.eleceng.ohio-state.edu/~passino/.
Assessment: Class tests/assignments throughout the semester 20%; Laboratory work 40%; Project work 40%.

VEA4400 ROBOTICS AND AUTOMATION

Locations: Footscray Park.
Prerequisites:VEF1002 Enabling Sciences 1B and VEF1004 Electrical Fundamentals 1B.
Description: Programmable Logic Controllers: Introduction to PLCs, programming and application. Overview of Robotics, classification, control methods, drive mechanisms. Programming and applications of specific robots. Homogenous transforms, configurations. Euler angles. Manipulator Kinematics. Introduction to KAREL. Robotic Vision: vision systems, introduction to image processing, edge detection algorithms, 2D recognition, stereo vision.
Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- apply programmable logic controllers and manipulators in factory automation,
- program robots for manufacturing tasks,
- analyse and design vision systems for automatic inspection and guidance.

Class Contact:30 hrs of contact comprising 15 hrs of lectures/tutorials and 15hrs of Laboratory.
Required Reading: Handout Notes.
Assessment: Examination 40%, Tests 10%, Laboratory Assignments 50%.

VEA6311 MODELLING AND COMPUTER CONTROL

Locations: Footscray Park.
Prerequisites:VEA6310 - LINEAR SYSTEMS AND CONTROL
Description: Overview of computer control. Sampling of continuous-time signal. Computer-oriented mathematical models; discrete-time systems. Linear regression model and system identification. Analysis of discrete-time control systems. Translation of analog design. State-space design methods. Implementation of digital controllers. Introduction to adaptive control.
Credit Points:12
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Required Reading: Astrom, K.J. and Wittenmark, B., Computer Controlled Systems, Prentice Hall, 1990.
Assessment: Tests, 20%; Examination, 80%. A pass in each component of assessment is required for a subject pass.

VEA6312 MODEL BASED PROCESS CONTROL

Locations: Footscray Park.
Prerequisites:VEA6310 - LINEAR SYSTEMS AND CONTROL
Description: Overview of model based control design. Model complexity and the model building process. Design of robust control systems by the internal model control method; performance and robustness trade-off. Difficulty in the realisation of continuous-time Smith Predictors; design of the unified predictive controller (UPC). Analysis of design parameters and tuning of the UPC.
Credit Points:12
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Required Reading: To be advised by the lecturer.
Assessment: Tests, 20%; Examination, 80%. A pass in each component of assessment is required for a subject pass.

VEA6321 FUZZY AND NEURAL CONTROL

Locations: Footscray Park.
Prerequisites: Nil.
Description: Introduction to fuzzy sets and fuzzy logic theory. Fuzzy set operations. Theoretical fundamentals of fuzzy control: the structure of a fuzzy logic controller, the rule base, the inference engine, choice of fuzzification and defuzzification procedures. Introduction to different neural networks and neural-fuzzy controllers. Software and hardware tools of neural-fuzzy control. Neural-fuzzy controller design using software packages. Applications of neural-fuzzy control.
Credit Points:12
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Required Reading: Reznik, L., Fuzzy Controllers, Butterworth-Heinemann, Oxford, 1997. Passino, K.M. and Yurkovich, S., 1998, Fuzzy Control, Addison-Wesley
Assessment: To be advised by lecturer.

VEA6322 PROCESS INSTRUMENTATION AND CONTROL

Locations: Footscray Park.
Prerequisites: Nil.
Description: Process linear systems and control and goals. Process characteristics and system parameters. Controller modes, control structures and algorithms. Process instrumentation. Distributed control systems. Networking in process control, monitoring, planning, and system management. Specification and selection of process control hardware and software.
Credit Points:12
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Required Reading: To be advised by the lecturer.
Assessment: Laboratory exercises, 20%; Examination, 80%. A pass in each component of assessment is required for a subject pass.

VEA6331 ROBOTICS AND PROGRAMMED CONTROL

Locations: Footscray Park.
Prerequisites: Nil.
Description: Overview of robotics. classification, control methods, drive mechanisms. Programming and applications of specific robots. Manipulator kinematics: Homogeneous transforms, Denavit-Hartenberg representations of jointed link systems. Analysis of various robot configurations. Euler angles. Inverse kinematic solutions. Robotic vision: Vision systems, introduction to image processing, Hough

Transform methods, Stereo vision. Programmable Logic Controllers: Introduction to PLCs, programming and applications. Neural Networks: Introduction of NNs and applications to robotics.
Credit Points:12
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Required Reading: McKerrow, P.J., Introduction to Robotics, Addison Wesley, 1991.
Assessment: Assignments and laboratory exercises: 60%; Examination: 40%. A pass in each component of assessment is required for a subject pass.

VEA6332 ELECTRONIC CONTROL OF MOTORS

Locations: Footscray Park.
Prerequisites: Nil.
Description: Review of basic principles of electromagnetism and electric motors. Models of induction motors. Reference frame transformations. Inverters; power switches, Six Step and PWM types. Harmonics and their elimination. Scalar control techniques. Vector control techniques. Rotor flux orientation schemes, and their requirements for implementation. Current controlled inverters.
Credit Points:12
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Required Reading: To be advised by the lecturer.
Assessment: Tests/Assignments, 20%; Examination, 80%. A pass in each component of assessment is required for a subject pass.

VEA6341 MEASUREMENT TECHNOLOGY

Locations: Footscray Park.
Prerequisites: Nil.
Description: Application of electronics for instrumentation of real plant. Analogue devices used for signal conditioning and processing. Techniques for dealing with interference. Interfacing digital and analogue circuits. Transducers and their application.
Credit Points:12
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Required Reading: To be advised by the lecturer.
Assessment: Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

VEA6342 POWER DISTRIBUTION SYSTEMS

Prerequisites: Nil.
Credit Points:12

VEA6351 POWER SYSTEMS OPERATION AND CONTROL

Prerequisites: Nil.
Credit Points:12

VEA6352 DIGITAL SIMULATION OF PROTECTION SYSTEMS

Prerequisites: Nil.
Credit Points:12

VEB1100 ENGINEERING DESIGN AND PRACTICE 1A

Locations: Footscray Park.
Prerequisites: Year 12 mathematics.
Description: This is a practical, PBL mode, unit in which students work in teams to solve a number of problems specifically designed to integrate with the learning and content from VEF1001 and VEF1003. Teams of students will have an Electrical Engineering staff member as a 'coach or mentor' whilst working on these problems. 'Specialist' staff from the VEF1001 and VEF1003 units will be available to assist students with technical aspects of the problems. Staff members from the School of Communication, Culture and Languages will be available on a weekly basis to assist with the development of communications skills. Staff members from other Faculties and the will be available to provide workshops to assist students with the development of generic skills.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply knowledge of basic science and engineering fundamentals;
- Communicate effectively, not only with engineers but also with the community at large;
- Display in-depth technical competence in at least one engineering discipline;
- Work on problem identification, formulation and solution;
- Utilise a systems approach to design and operational performance;
- Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
- Discuss the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development;
- Describe the principles of sustainable design and development;
- Discuss professional and ethical responsibilities and display a commitment to them;
- Recognise the need for undertaking lifelong learning;
- Locate, evaluate, manage and use information effectively.

Class Contact:10 hours per week or equivalent for one semester.
Required Reading: Bazerman, C., & Wiener, H. S. (2003). Writing skill handbook (5th ed.). New York: Houghton Miflin. Faculty of Health, Engineering and Science. (2006). Handbook of Communication Skills for first year students in the Faculty of Health, Engineering and Science (8th ed.). Victoria University.
Assessment: Students will be assessed in this unit on the basis of a portfolio, in which they are required to demonstrate the attainment of learning outcomes using:- peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports.

VEB1200 ENGINEERING DESIGN AND PRACTICE 1B

Locations: Footscray Park.
Prerequisites:VEB1100 - ENGINEERING DESIGN AND PRACTICE 1A
Description: This is a practical, PBL mode, unit in which students work in teams to solve a number of problems specifically designed to integrate with the learning and content from VEF1002 and VEF1004. Teams of students will have an Electrical Engineering staff member as a 'coach or mentor' whilst working on these problems.

'Specialist' staff from the VEF1002 and VEF1004 units will be available to assist students with technical aspects of the problems. Staff members from the School of Communication, Culture and Languages will be available on a weekly basis to assist with the development of communications skills. Staff members from other Faculties will be available to provide workshops to assist students with the development of generic skills.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply knowledge of basic science and engineering fundamentals;
- Communicate effectively, not only with engineers but also with the community at large;
- Display in-depth technical competence in at least one engineering discipline;
- Work on problem identification, formulation and solution.
- Utilise a systems approach to design and operational performance;
- Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
- Discuss the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development;
- Describe the principles of sustainable design and development;
- Discuss professional and ethical responsibilities and display a commitment to them;
- Recognise the need for undertaking lifelong learning.

Class Contact:10 hours per week or equivalent for one semester.
Required Reading: Bazerman, C., & Wiener, H. S. (2003). Writing skill handbook (5th ed.). New York: Houghton Miflin. Faculty of Health, Engineering and Science. (2006). Handbook of Communication Skills for first year students in the Faculty of Health, Engineering and Science (8th ed.). Victoria University.
Assessment: Students will be assessed in this unit on the basis of a portfolio, in which they are required to demonstrate the attainment of learning outcomes using:- self and peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports.

VEB2100 ENGINEERING DESIGN AND PRACTICE 2A

Locations: Footscray Park.
Prerequisites:VEB1200 - ENGINEERING DESIGN AND PRACTICE 1B
Description: This is a practical, PBL mode, unit in which students work in teams to solve a number of problems specifically designed to integrate with the learning and content from VEF2001 and VEF2003. Teams of students will have an Electrical Engineering staff member as a coach or mentor whilst working on these problems. Specialist staff from the VEF2001 and VEF2003 units will be available to assist students with technical aspects of the problems. Staff members from the School of Communication, Culture and Languages will be available on a weekly basis to assist with the development of communications skills. Staff members from other Faculties will be available to provide workshops to assist students with the development of generic skills.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply knowledge of basic science and engineering fundamentals;
- Communicate effectively, not only with engineers but also with the community at large;
- Display in-depth technical competence in at least one engineering discipline;
- Work on problem identification, formulation and solution.
- Utilise a systems approach to design and operational performance;
- Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
- Discuss the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development;
- Describe the principles of sustainable design and development;
- Discuss professional and ethical responsibilities and display a commitment to them;
- Recognise the need for undertaking lifelong learning.

Class Contact:10 hours per week for one semester
Required Reading: There are no prescirbed readings for this unit. Students will be guided by the unit co-ordinator to material relevant to the student's design project.
Assessment: Students will be assessed in this unit on the basis of attendance and participation (10%), project demonstrations (10%), oral presentations (10%), written technical paper (10%) and report (10%) as well as a portfolio (50%). In the portfolio, students are required to demonstrate the attainment of learning outcomes using:- peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports.

VEB2200 ENGINEERING DESIGN AND PRACTICE 2B

Locations: Footscray Park.
Prerequisites: Nil.
Description: This is a practical, PBL mode, unit in which students work in teams to solve a number of problems specifically designed to integrate with the learning and content from VEF2002 and VEF2004. Teams of students will have an Electrical Engineering staff member as a coach or mentor whilst working on these problems. Specialist staff from the VEF2002 and VEF2004 units will be available to assist students with technical aspects of the problems. Staff members from the School of Communication, Culture and Languages will be available on a weekly basis to assist with the development of communications skills. Staff members from the other schools will be available to provide workshops to assist students with the development of generic skills.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply knowledge of basic science and engineering fundamentals;
- Communicate effectively, not only with engineers but also with the community at large;
- Display in-depth technical competence in at least one engineering discipline;

- Work on problem identification, formulation and solution;
- Utilise a systems approach to design and operational performance;
- Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
- Discuss the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development;
- Describe the principles of sustainable design and development;
- Discuss professional and ethical responsibilities and display a commitment to them;
- Recognise the need for undertaking lifelong learning;
- Locate, evaluate, manage and use information effectively.

Class Contact:10 hours per week or equivalent for one semester.
Required Reading: To be provided upon commencement of the unit to suit the student's design project(s).
Assessment: Students will be assessed in this unit on the basis of a portfolio, in which they are required to demonstrate the attainment of learning outcomes using:- self and peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports.

VEB3100 ENGINEERING DESIGN AND PRACTICE 3A

Locations: Footscray Park.
Prerequisites:VEB2200 - ENGINEERING DESIGN AND PRACTICE 2BVEF2004 - SYSTEMS & APPLICATIONS 2DOR
Description: This unit is designed to create the opportunity for students to integrate generic skills with the learning and content from the concurrent third year subjects. The PBL approach to this unit of study requires students to form a holistic consideration of problems which are not only technical in nature but also exercise the students generic skills. Students are required to demonstrate critical thinking, problem solving skills, systems thinking and professional engineering practice. The unit is delivered in PBL mode and will encourage students to become independent learners and self reflective about professional communication processes and practices.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply knowledge of basic science and engineering fundamentals;
- Communicate effectively, not only with engineers but also with the community at large;
- Display in-depth technical competence in at least one engineering discipline;
- Work on problem identification, formulation and solution;
- Utilise a systems approach to design and operational performance;
- Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
- Discuss the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development;
- Describe the principles of sustainable design and development;
- Discuss professional and ethical responsibilities and display a commitment to them;
- Recognise the need for undertaking lifelong learning;
- Locate, evaluate, manage and use information effectively.

Class Contact:10 hours per week for one semester.
Required Reading: There are no prescribed readings for this unit. Students will be guided by the unit co-ordinator to material relevant to the unit.
Assessment: Students will be assessed in this unit on the basis of a portfolio, oral presentations, project demonstration, and written technical report. In the portfolio students are required to demonstrate the attainment of learning outcomes using: peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports. The weightings of the components mentioned above are:- Workshop attendance and participation: 10% Oral presentation: 10% Semester and final team product demonstration: 30% Written technical report: 30% Reflective Journal Portfolio: 20%

VEB3101 ENGINEERING PROJECT 3A

Locations: Footscray Park.
Prerequisites: Successful completion of EBES Year 2.
Description: Application of system analysis and design principles to develop a detailed specification, detailed design and test plan for a project with substantial software and/or hardware components. Development of the system is undertaken in a staged process, with deliverables and presentation at the end of each stage.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- explain the principle of system analysis and design and be able to apply this methodology to project work;
- produce necessary project documentation that could be used for implementation and testing of the hardware and/or software by a suitablly qualify engineering technologists or engineers.

Class Contact:30 hours of contact comprising 12 hrs of lectures/tutorials and 24 hours of laboratory and project work.
Required Reading: Ng, Y. (Ed.). (2008). Class notes (Rev. ed.). Footscray, Australia: Victoria University, School of Electrical Engineering.
Assessment: Project work (60%); Examination (40%).

VEB3102 ENGINEERING PROJECT 3B

Locations: Footscray Park.
Prerequisites:VEB3101 - ENGINEERING PROJECT 3A
Description: Application of software, hardware techniques and research skills acquired in the course to implement and test an individual project according to a detailed specification and test plan.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to demonstrate their abilities to work independently and professionally on a substantial hardware and/or software project. Students are expected to also be able to:

- apply theories and techniques from various specialisations to solve complex engineering problem;
- implement and test a project according to a detailed specification and test plan.

Class Contact:30 hours of Project work.
Required Reading: There is no prescribed reading for this unit. Students will be guided by the unit co-ordinator to material relevant to the project.
Assessment: Project work (100%).

VEB3200 ENGINEERING DESIGN AND PRACTICE 3B

Locations: Footscray Park.
Prerequisites:VEB3100 - ENGINEERING DESIGN AND PRACTICE 3Aplus Year 3 semester 1 Stream Core Unit.
Description: This unit is designed to create the opportunity for students to integrate generic skills with the learning and content from their chosen specialisation unit. The PBL approach to this unit of study requires students to form a holistic consideration of problems which are not only technical in nature but also exercise the students generic skills. Students are required to demonstrate critical thinking, problem solving skills, systems thinking and professional engineering practice. The unit is delivered in PBL mode and will encourage students to become independent learners and self reflective about professional communication processes and practices.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply knowledge of basic science and engineering fundamentals;
- Communicate effectively, not only with engineers but also with the community at large;
- Display in-depth technical competence in at least one engineering discipline;
- Work on problem identification, formulation and solution;
- Utilise a systems approach to design and operational performance;
- Function effectively as an individual and in multi-disciplinary and multi-cultural teams, with the capacity to be a leader or manager as well as an effective team member;
- Discuss the social, cultural, global and environmental responsibilities of the professional engineer, and the need for sustainable development;
- Describe the principles of sustainable design and development;
- Discuss professional and ethical responsibilities and display a commitment to them;
- Recognise the need for undertaking lifelong learning;
- Locate, evaluate, manage and use information effectively.

Class Contact:10 hours per week for one semester.
Required Reading: There are no prescribed readings for this unit. Students will be guided by the unit co-ordinator to material relevant to the unit.
Assessment: Students will be assessed in this unit on the basis of a portfolio, oral presentations, project demonstration, and written technical report. In the portfolio students are required to demonstrate the attainment of learning outcomes using: peer evaluation and assessment, weekly team/client meetings, a reflective journal, reflective essays, expositions, audio/visual project presentations and written project reports. The weightings of the components mentioned above are:- Workshop attendance and participation: 10% Oral presentation: 10% Semester and final team product demonstration: 30% Written technical report: 30% Reflective Journal Portfolio: 20%

VEB4006 DIRECTED STUDIES IN ELECTRICAL ENGINEERING 1

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit is to provide prescribed learning outcomes tailored to the requirements of students transferring into undergraduate programs offered by the School of Electrical Engineering. The outcomes will be defined by the School on an individual, as-required, basis. The unit is intended to facilitate both articulation students and students with recognised prior learning that does not lend itself to simple mapping into the units offered in their selected program. The content will be a subset of the content of a core program unit of study, which matches both the required learning outcomes and is defined by the School to satisfy the 6 credit point weighting of this unit.
Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study;
- Locate the relevant underpinning theory in references available to them;
- Use that support and sppropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel sitiation to reach a solution to the problem posed.

Class Contact:5 hours per week or equivalent for one semester.
Required Reading: To be prescribed by the School.
Assessment:A series of assignments, tests and reports as negotiated for each individual or group of students with a similar background.

VEB4012 DIRECTED STUDIES IN ELECTRICAL ENGINEERING 2

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit is to provide prescribed learning outcomes tailored to the requirements of students transferring into undergraduate programs offered by the School of Electrical Engineering. The outcomes will be defined by the School on an individual, as-required, basis. The unit is intended to facilitate both articulation students and students with recognised prior learning that does not lend itself to simple mapping into the units offered in their selected program. The content will be a subset of the content of a core program unit of study, which matches both the required learning outcomes and is defined by the School to satisfy the 12 credit point weighting of this unit.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Identify the key elements in a previously unseen problem associated with the negotiated content area of this unit of study;
- Locate the relevant underpinning theory in references available to them;

- Use that support and appropriate mathematical and laboratory techniques, where necessary, to apply that information to the novel situation to reach a solution to the problem posed.

Class Contact:10 hours per week or equivalent for one semester.
Required Reading: To be prescribed by the School.
Assessment:A series of assignments, tests and reports as negotiated for each individual or group of students with a similar background.

VEB4100 ENGINEERING DESIGN 4A

Locations: Footscray Park.
Prerequisites:ENE3200 - ENGINEERING DESIGN AND PRACTICE 3B
Description: In this unit, students will commence a major design problem resulting in a complete and working outcome which meets the agreed specifications and demonstrates an understanding of professional engineering standards. The project will continue in the follow-on second semester unit VEB4200. The student will define the problem, develop functional specifications (in collaboration with the project supervisors), and write a concise project contract. A feasibility study is the next stage. Possible alternative engineering solutions are conceptualised and evaluated using objective criteria functions. Cost, reliability, sustainability and environmental impacts should also be considered in choosing the best approach, which the student should be able to defend in an objective way. All progress work on the design should be documented in notebooks, and written progress reports and oral presentation will be required during the course of the problem. The final report should document the complete design process, the synthesis and analysis of the design, prototyping, experimental testing, refinement of the design, the final product and full performance testing and comparison with the specifications. Projects should where possible originate from industry, and address real problems which the industrial sponsors are confronting. Each student will work individually on a defined part of a design problem, but these parts may be components of a bigger project requirement. Supervisors: Each student will be assigned an academic staff supervisor and an industrial supervisor from the sponsor company where appropriate. In addition to formal written and oral reports, the student should maintain regular informal reporting channels to both supervisors.
Credit Points:12

Learning Outcomes: In addition to the learning outcomes from the Years 1 to 3 Engineering Design and Practice units, on successful completion of this unit, students are expected to be able to:

- Undertake problem identification, formulation and solution;
- Explain environmental and sustainability issues in problem solution;
- Utilise a systems approach to complex design problems;
- Synthesise solutions, and use analysis to verify designs, using computing tools where appropriate;
- Demonstrate skills in prototyping and testing engineering projects;
- Manage a project, designing to specification, and meeting outcomes and reporting timelines;
- Manage information and documentation;
- Interface with and communicate with other designers who may be working on related project tasks;
- Write a competent feasibility study, progress reports, and a substantial final report;
- Deliver fluently, oral progress presentations, and a high quality final presentation supported with appropriate audio/visual aids.

Class Contact: One hour per week or equivalent for one semester comprising on average ½ hour/week in progress presentations, and ½ hour/week meeting with the project supervisor. Most of the work in this unit will occur outside formal classes.
Required Reading: Horowitz, P., & Hill, W. (1989). The art of electronics (2nd ed.). Cambridge University Press. Other reading will depend on the nature of the project undertaken.
Assessment: The written contract, written feasibility and progress reports, and oral progress presentations (50%); Prototype and experimental hardware/software demonstrating progress with the design work (30%); The overall quality of the project work (20%).

VEB4200 ENGINEERING DESIGN 4B

Locations: Footscray Park.
Prerequisites:VEB4100 - ENGINEERING DESIGN 4A
Description: In this unit, students will commence a major design problem resulting in a complete and working outcome which meets the agreed specifications and demonstrates an understanding of professional engineering standards. The student will define the problem, develop functional specifications (in collaboration with the project supervisors), and write a concise project contract. A feasibility study is the next stage. Possible alternative engineering solutions are conceptualised and evaluated using objective criteria functions. Cost, reliability, sustainability and environmental impacts should also be considered in choosing the best approach, which the student should be able to defend in an objective way. All progress work on the design should be documented in notebooks, and written progress reports and oral presentation will be required during the course of the problem. The final report should document the complete design process, the synthesis and analysis of the design, prototyping, experimental testing, refinement of the design, the final product and full performance testing and comparison with the specifications. Projects should where possible originate from industry, and address real problems which the industrial sponsors are confronting. Each student will work individually on a defined part of a design problem, but these parts may be components of a bigger project requirement. Supervisors: Each student will continue with the academic staff supervisor assigned in VEB4001, and the industrial supervisor from the sponsor company where appropriate. In addition to formal written and oral reports, the student should maintain regular informal reporting channels to both supervisors.
Credit Points:12

Learning Outcomes: In addition to the learning outcomes from the Years 1 to 3 Engineering Design and Practice units, on successful completion of this unit, students are expected to be able to:

- Undertake problem identification, formulation and solution;
- Explain environmental and sustainability issues in problem solution;
- Utilise a systems approach to complex design problems;
- Synthesise solutions, and use analysis to verify designs, using computing tools where appropriate;
- Demonstrate skills in prototyping and testing engineering projects;
- Manage a project, designing to specification, and meeting outcomes and reporting timelines;
- Manage information and documentation;

- Interface with and communicate with other designers who may be working on related project tasks;
- Write a competent feasibility study, progress reports, and a substantial final report.

Class Contact: One hour per week or equivalent for one semester comprising on average ½ hour/week in progress presentations, and ½ hour/week meeting with the project supervisor. Most of the work in this unit will occur outside formal classes.
Required Reading: There are no prescribed readings for this unit. Students will be guided by the unit co-ordinator to material relevant to the project being undertaken.
Assessment: Written progress reports, progress oral presentations, the final oral presentation, and the final project report (50%); Successful completion of a working project design which meets the project specifications (30%); The overall quality of the design process and the project as a whole (20%).

VEC6111 COMPUTER TECHNOLOGY

Locations: Footscray Park.
Prerequisites: Nil.
Description: The subject investigates high level design techniques used in computer system hardware development. The subject examines the algorithmic state machine design mathod. Controller and architecture division. Controller design methods. Linked and partitioned state machines. Register transfer language and synthesis. Logical faults and test vector generation. Asychronous system analysis and design.
Credit Points:12
Class Contact: Three hours per week for one semester.
Required Reading: To be advised by the lecturer.
Assessment: Final examination, 65%; tests, 35%;

VEC6112 ADVANCED MICROPROCESSORS

Locations: Footscray Park.
Prerequisites:A course in C programming.
Description: The subject will provide the student with an appreciation of operating system's functions and requirements, including real-time operation, and will examine the use of concurrent languages. The subject examines the following topics. Operating system's functions. Program scheduling. Pipeline design techniques Data and instruction stream. Parallelisms. Contention and arbitration. Message passing techniques. Lock out prevention. Mutual exclusion. Tagged memory systems; cache memory, FIFO, multi port. Multiprocessor operating systems. Process to process or mapping vs process sharing. Diagnostic and performance profiling program. Recovery procedure. Application program and operating system interaction. Throughput measurement. Multiprocessing. analysis of various multiprocessors, data flow machines and non Neumann machines. RISC Array processors Embedded systems, reala time applications.
Credit Points:12
Class Contact: Three hours per week for one semester comprising lecture, tutorials and laboratories.
Required Reading: To be advised by the lecturer.
Assessment: Examination 100%

VEC6121 OBJECT ORIENTED SOFTWARE

Locations: Footscray Park.
Prerequisites: Nil.
Description: This subject will study the object oriented approach to software development through the analysis, design and implementtion phases of the software life cycle. Its content includes the object oriented (OO) concepts of classes, inheritance, polymorphism, encapsulations; and the use of Object Oriented languages and environments. It applies the techniques to engineering applications.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two hours lecturers/tutorials and one one-hour laboratory.
Required Reading: To be advised by the lecturer
Assessment: Assignments 35%; examination 65%.

VEC6122 OPERATING SYSTEMS AND MULTIPROCESSING

Locations: Footscray Park.
Prerequisites:A course in C programming.
Description: The subject will provide the student with an appreciation of operating system's functions and requirements, including real-time operation, and will examine the use of concurrent languages. The subject examines the following topics. Operating system's functions. Program scheduling. Pipeline design techniques Data and instruction stream. Parallelisms. Contention and arbitration. Message passing techniques. Lock out prevention. Mutual exclusion. Tagged memory systems; cache memory, FIFO, multi port. Multiprocessor operating systems. Process to process or mapping vs process sharing. Diagnostic and performance profiling program. Recovery procedure. Application program and operating system interaction. Throughput measurement. Multiprocessing. analysis of various multiprocessors, data flow machines and non Neumann machines. RISC Array processors Embedded systems, reala time applications.
Credit Points:12
Class Contact: Three hours per week for one semester.
Required Reading: To be advised by the lecturer.
Assessment: Assignment, 20%; laboratory, 15%; examination 65%.

VEC6131 COMPUTER INTERCONNECTION HARDWARE

Locations: Footscray Park.
Prerequisites: Nil.
Description: The subject develops an understanding of microprocessor interconnection schemes and of the hardware and software aspects of computer networks. The topics covered are: review of synchronous and and asynchronous design techniques; characteristics of bus lines and interface design; single-master buses; multiple-master bus; DMA circuits; synchronisation; computer to computer interconnection schemes, principle of operation standardisation and OSI model; point-to-point transfers, protocols, bidirectional links; error handling; links, concentrators and multiplexors; TDM circuits, PCM multiplexing; modern and network (e.g. token ring) interface design.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two hours per week lecturers/tutorials and one one-hour laboratory.
Required Reading: To be advised by lecturer.
Assessment: Final examination 65%; assignments and laboratory work, 35%. Students must attain a satisfactory level of performance in each assessable component to obtain a subject pass.

VEC6132 DIGITAL SYSTEM MODELLING AND SIMULATION

Locations: Footscray Park.
Prerequisites: Nil.
Description: The subject will accustom the student with the computer aided design environment, and examines modelling and software techniques applicable to digital design problems. Topics to be studied include computer aided design tools, software, user interfaces; discrete event modelling and modelling languages VHAL; digital logic

simulators. FPGA implementation.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two hours of lecture/tutorial and one one-hour laboratory.
Required Reading: To be advised by the lecturer.
Assessment: Final examination, 65%, assignments and laboratory work 35%. Students must attain a satisfactory level of performance in each assessable component to obtain a subject pass.

VEC6141 SOFTWARE ENGINEERING

Locations: Footscray Park.
Prerequisites:VES4301 - SOFTWARE ENGINEERING
Description: The subject will strengthen the student's knowledge of concepts required to produce high quality software systems within known limitations of resources using sound engineering principles and effective tools. The subject examines principles of software engineering. The topics convered are part of the software life cycle. Requirements elicitation, requirements analysis and specification. the use of formal specification languages such as 'Z'. Analysis and design methods using graphical notations e.g. UML, implementation considerations, testing strategies and construction of test cases, software engineering environments and CASE; tools.
Credit Points:12
Class Contact: Three hours per week for one semester comprising approximately 70% lecturers/tutorials and 30% laboratory.
Required Reading: Schach, S.R., 1999, Classical and Object-Oriented Software Engineering with UML and Java 4th edn. McGraw Hill.
Assessment: Examination, 65%; laboratory work, tests and assignments 35%. Students must satisfy examiners in each assessable component to pass the subject.

VEC6142 MANAGING SOFTWARE PROJECTS

Locations: Footscray Park.
Prerequisites:VEG5011 Software Engineering.
Description: The subject will develop and improve the skills required to successfully plan and manage software development efforts. The subject content includes: the role of specification in the product life cycle; systems analysis and design; feasibility study and development cycle; the applicability of DP techniques to technical program management; defining software requirements, documentation; preparation of good project plans, size and function point metrics and their use in estimation of time and costs; implementing management controls for design and integration; the use of standard project management techniques and software packages; team working, codes of practice, whole life costing, system support plans; hardware/software integration and testing, product support and maintenance, controlling changes to software and documentation; control of the programming support environment. The assignment and laboratory work consists of design, analysis and management of a large scale software project.
Credit Points:12
Class Contact: Three hours per week for one semester comprising approximately 65% lectures/tutorials and 35% laboratory.
Required Reading: To be advised by lecturer.
Assessment: Examination, 50%; assignments and project work, 50%.

VEC6151 DATABASE AND QUERY SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: The subject will further the understanding of the design implementation and applications of database systems. The subject examines introduction to database systems; different database models; examples of current systems; overviews and use of DMBS, physical data organisation, database architecture, SQl, query by example; query optimisation; design theory for relational databases, database integrity and security; implementation issues, distributed systesm.
Credit Points:12
Class Contact: Three hours per week for one semester comprising approximately 70% lectures/tutorials and 30% laboratory.
Required Reading: To be advised by the lecturer.
Assessment: Final examination 65%; assignments, 20%; laboratory work, 15%.

VEC6152 APPLIED KNOWLEDGE SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: The subject provides an introduction to Knowledge Based Systems. It gives an overview of expert systems, neural networks, knowledge programming and natural language systems and examines software associated with these. The subject will familiarise the students with a number of techniques for applying knowledge based systems to real world problems in the control, monitoring and planning domains, including how to select appropriate tools to analyse problems.
Credit Points:12
Class Contact: Three hours per week for one semester. This includes two hours of lecture per week, one hour of tutorial and one hour of laboratory for every two weeks.
Required Reading: To be advised by the lecturer.
Assessment: Tests/Assignments: 35%; Examination: 65%. A pass in each component of assessment is required for a subject pass.

VED4001 ENGINEERING DESIGN & PROJECTS 4A

Locations: Footscray Park.
Prerequisites: Completed year 3 of the course.
Description: The unit consolidates engineering design experience by requiring each student to undertake an individual engineering design project, selected from a list of projects on offer. Projects are sourced from industry and academia, and span both semesters. In this subject, progress to a viable halfway stage is expected. Each student is supervised by a staff member expert in the area of the project. Oral presentation skills, and report writing ability are further developed from the level attained in third year. The theory component covers the philosophy of system design, and designing for variability, emphasising the gulf between designing a working prototype, and designing for production. Worst case and Monte Carlo techniques are covered.
Credit Points:12
Class Contact:48 hours per semester, consisting of 36 hours of project work and project reporting, and 12 hours of lectures. Students are expected to spend additional non-class time on project work.
Required Reading: Clive, L.D. and Little, P., 2000, Engineering Design - A Project Based Introduction, John Wiley & Sons Inc. Denny, H.W., 1983, Grounding for the Control of EMI, Dan White Consultants Inc. Morrison, R. 1977, Grounding and Shielding Techniques in Instrumentation, John Wiley. Williams, T., 1995, EMC for Product Designers, Newnes. Tuinenga, P.W., 1988, SPICE - A Guide to Circuit Simulation and Analysis Using SPICE, Prentice Hall. Mohan, T., McGregor, H., Saunders, S. and Archee, R., 1997, Communication Theory and Practice, Harcourt Brace.
Assessment: Project contract 5%, feasibility study report 10%, progress talks 5%, final presentation talk 10%, project stage A report, and project progress and quality 45%, assignments, tests 25%.

VEE3001 INTRODUCTION TO ELECTRICAL MACHINES

Locations: Footscray.

Prerequisites:VEF2004 Systems and Applications 2D

Description: This unit of study is intended to provide a sound knowledge of induction and synchronous machines including equivalent circuits, performance analysis based on the equivalent circuits, and operating characteristics under varying operating conditions. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial, the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented. Unit Content Introduction to induction motor and rotating field. Equivalent circuit of an induction motor. Power, torque, efficiency, power factor calculations. Induction motor starting. Speed control of induction motor. Introduction to synchronous machines. Synchronous motors and their characteristics. Synchronous generators. Loci of synchronous motor. Synchronous motor starting.

Credit Points:6

Learning Outcomes: On successful completion of this unit, it is expected that students will be able: To develop an understanding of the structure of A.C. electrical machines and the purpose of the various components. To develop equivalent circuit models for the machines. Learn to calculate the operating characteristics of machines using the equivalent models (power, torque, efficiency, power factor etc.).To develop an understanding of staring dynamics of motors.Develop an understanding of appropriate applications of A.C. machines in industries.

Class Contact:30 hrs of class contact: Two and an half hours per week.

Required Reading: Theodore Wildi, 2002, Electrical Machines, Drives and Power Systems, fifth Edition, Prentice Hall.

Assessment: Written examination 65% Test 20% Laboratory 15%.

VEE3002 INTRODUCTION TO ELECTRICAL POWER SYSTEMS

Locations: Footscray.

Prerequisites:VEF2004 Systems and Applications 2D

Description: This unit of study is intended to provide an introduction to electrical power systems. The unit will cover topics of generation, transmission, and distribution systems at introductory levels. Various types of generation systems will be introduced. Different types of transmission/distribution systems and associated gears will be introduced. Models of long, medium and short transmission lines will be introduced to assist in calculation of power, voltage, current and power factor. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial, the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to: develop an understanding on power systems components. Understand the configuration and operation of a power system. Develop skills in calculating the electrical parameters in a power system. Gain knowledge in ways of controlling frequency and voltage in a power system.

Class Contact:30 hrs of class contact. Two and an half hours per week.

Required Reading: Theodore Wildi 2002, Electrical Machines, Drives and Power Systems, fifth Edition, Prentice Hall.

Assessment: Written examination 65% Test 20% Laboratory 15%.

VEE4100 ELECTRIC ENERGY SYSTEMS ANALYSIS AND OPERATION

Locations: Footscray Park.

Prerequisites: Nil.

Description: Electricity distribution in the deregulated Australian power industry. Admittance model and Network Calculations Load flow analysis techniques, Gauss Siedel and Newton Raphson methods, uses of load flow analysis, cases studies. Economic operation of power systems. The planning, design and operation of electrical energy transmission and distribution networks: planning, design standards and performance requirements. voltage control. power quality and reliability. overvoltage protection. earthing and safety. embedded generation. power electronic systems for performance improvement.

Credit Points:6

Class Contact:30 hours comprising 24 hours of lectures/tutorial and 6 hours of laboratory.

Required Reading: Grainger J. J. and Stevenson W.D. Power System Analysis, 1994, McGraw Hill.

Assessment: Assignment and Laboratory Exercises 40%; End of semester examination 60%; A pass in each component of assessment is required for a subject pass.

VEE4200 ELECTRIC ENERGY SYSTEMS PROTECTION

Locations: Footscray Park.

Prerequisites: Nil.

Description: This subject covers the planning, design and operation of electrical protection systems for the generation, transmission and distribution electric energy: planning, design standards and performance requirements; principles and types of protection systems (overcurrent, impedance, differential, backup, fuses); application to generators, motors, transmission lines, transformers, busbars, and distribution; instrument transformer steady state and transient behaviour; electrical studies for planning and design of protection systems; power system communications for protection application.

Credit Points:6

Class Contact:30 hours of class contact comprising 24 hours of lectures/tutorial and 6 hours of laboratory.

Required Reading: Lecture notes provided.

Assessment: Assignment and Laboratory Exercises 40%; End of semester examination 60%; A pass in each component of assessment is required for a subject pass.

VEE4400 HIGH VOLTAGE ENGINEERING

Locations: Footscray Park.

Prerequisites: Nil.

Description: Electrical insulation properties and characteristics, insulator selection, insulation co-ordination in electric energy networks, sources of overvoltages, lightning impact on transmission and distribution networks, surge propagation theory, circuit interruption theory and circuit breaker operation.

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Analyse and describe the various insulator technologies
- Analyse surge propogation and its impact on electrical networks
- Study circuit breaker operation.

Class Contact:30 hours of class contact comprising 24 hours of lectures/tutorial and 6 hours of laboratory.

Required Reading: Lecture notes provided.

Assessment: Assignment and Laboratory Exercises 40%; End of semester examination 60%; A pass in each component of assessment is required for a subject pass.

VEE4500 POWER ELECTRONICS

Locations: Footscray.

Prerequisites:VEF2004 Systems and Applications 2D

Description: Introduction to the theory, design and analysis of conversion of electric power by means of power electronics, including AC to DC and DC to DC power converters. The fundamental knowledge of electronic speed control techniques for DC motor drives for different applications. AC-DC single-phase and three-phase power converters: Diode and SCR bridge rectifiers. DC-DC Switching Mode Power Converters, buck converters and boost converters, Buck-boost converters. Unipolar and bipolar voltage switching method. Flyback converters, push pull converters. First quadrant, two quadrant and four quadrant drive. Different electronic speed control techniques for DC motor drives.

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Understand the basics and operations of power semiconductor switches.
- Know the building blocks of power electronics conversion.
- Analyse AC/DC and DC/DC power converters.
- Able to analyse and design different types of switching power supplies in different modes of operation.
- Able to demonstrate the knowledge of electronic speed control techniques for DC motor drives for different applications.

Class Contact:30 hrs of class contact consisting of 2 hrs of Lecture/Tutorial per week and 0.5 hrs of Laboratory per week.

Required Reading:1) Lecture notes provided. 2) N. Mohan, T. M. Undeland & W. P. Robbins, 2003, Power Electronics - Converters, Applications, and Design, John Wiley & Sons.

Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination, a mid-semester test and requires satisfactory performance of laboratory based components of this unit.

VEE4700 POWER SYSTEM COMMUNICATION, MONITORING AND INSTRUMENTATION

Locations: Footscray.

Prerequisites: Nil.

Description: Introduction to communication principles and terminologies used in power systems Leading global organisations and their standards Power system automation and integration concepts *Discussion on architectures, protocols as utilised in power system communication networks Middleware technologies Information embedded power systems Power system security aspects, SCADA and contingency analysis Network sensitivity methods; generation dispatch Operational metering Tariffs and wholesale energy trading Future technologies and their implications for power system communications

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- To be able to recognise the role of communications in power systems and identify various communication requirements needed in power system protection and distribution networks
- To have a basic understanding of the use of communication media and architectures in power systems
- To be able to understand the value of what global organisations like IEC and EPRI bring to the development of new technologies and structures for the advancement of power systems
- To be able to comprehend system automation and integration concepts
- To be able to have a basic knowledge about the communication standards, protocols and architectures most commonly employed in power system protection and distribution networks
- To be able to comprehend the importance of security and contingency analysis in the operation of power system networks
- To be able to identify the different instrumentation used in power systems
- To have a basic understanding about operational metering, tariffs and wholesale energy trading.

Class Contact:30 hours of class contact.

Required Reading: Kalam, A. and Kothari, D.P., 2008, Power System Communications, New Age International (P) Ltd, 2008.

Assessment: Students will be assessed in this unit of study based on an end of semester examination 60%, a team assignment 10%, word limit: 1000, a class test 10% and laboratory exercises 20%.

VEE4800 ALTERNATIVE ENERGY SYSTEMS

Locations: Footscray Park.

Prerequisites: Nil.

Description: The aim of this unit of study is to introduce students to unconventional energy sources such as solar, wind, biomass and fuel cells etc. and energy storage; problem facing the Electricity Supply Industries in Australia and its choices. The unit will focus on: Overview of major alternative sources and their energy content Environmental and economic advantages of using alternative energy generation technologies along with the concept of sustainability in order to provide the basis for the consideration of alternative energy systems The unit will cover: Conventional energy systems and green house effect Evaluation and feasibility studies of solar energy, wind energy, fuel cells, hydrogen generation, bio-fuel, tidal and geothermal systems Analysis and modelling of above systems Economic analysis of above systems Design of hybrid systems and integration

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Understand different alternative energy sources and their availability.
- Know the design and operation principles of alternative energy systems.
- Analyse economic and environmental impact of the alternative energy systems.
- Demonstrate an awareness of current applications of alternative energy systems.

Class Contact:4 hours per week. Total 48 hours comprising lecture/tutorials/laboratory

Required Reading: Masters, G 2004, 1st edn, Renewable and Efficient Electric Power Systems, John Wiley & Sons, Hoboken, NJ. Boyle, G 2004, 2nd edn, Renewable Energy: Power for a Sustainable Future, Oxford University Press, Oxford.
Assessment: Students will be assessed in this unit on the basis of an end of semester examination, a mid-semester test and requires satisfactory performance of laboratory based components of this unit.

VEE6001 RESEARCH PROJECT A

Locations: Footscray Park.
Prerequisites: Nil.
Description: The student will undertake an in depth investigation of a topic (project) allocated in the student's area of specialisation under the guidance of an academic supervisor.
Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Conduct research on a specific project topic using all available resources; books, journals, internet,
- Solve problems in a scientific manner, employing problem solving techniques;
- Plan and manage a project using project management facilities; Microsoft Project Manager.

Class Contact: Seventy two (72) hours or equivalent for one semester comprising group seminars, group meetings and discussions with fellow researchers and project supervisors.
Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.
Assessment: Progress presentations (2 seminars each of 15 min. duration) 30%; final report (Approximately 10,000 words) 50%; final presentation (30 min. duration) 20%. Presentation, Progress presentations, 30%. Report, Final report, 50%. Presentation, Final presentation, 20%.

VEE6002 RESEARCH PROJECT B

Locations: Footscray Park.
Prerequisites:VEE6001 - RESEARCH PROJECT AAnd completion of at least eight units of the EMEE Master of Engineering (Electrical & Electronic Engineering) course.
Description: Each student will continue the investigation carried out in VEE6001 to a higher level employing advanced research techniques, analysis of results, formulation of conclusion, documentation, final report writing, and presentation.
Credit Points:24
Learning Outcomes: On successful completion of this unit students are expected to be able to; 1. Independentely conduct research on a specific project topic using all available resources; books, journals, internet, 2. Solve problems in a scientific manner, employing problem solving techniques, 3. Plan and manage a project using project management facilities; Microsoft Project Manager, 4. Write and present professional technical reports.
Class Contact: Seventy two (72) hours or equivalent for one semester comprising group seminars, group meetings and discussions with fellow researchers and project supervisors.
Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.
Assessment: Progress presentation (2 seminars, each of 15 min. duration), Final report (approximately 15,000 words), Final presentation and demonstration. Presentation, Progress presentations, 20%. Report, Final Report, 50%. Presentation, Final presentation and demonstration, 30%.

VEE6050 PROJECT MANAGEMENT PROGRAM

Locations: Footscray Park.
Prerequisites: Nil.
Credit Points:48
Class Contact: For each unit: Three hours per week, comprising lectures, tutorials, seminars, and group activities.
Required Reading: Project Management Institute, 2000, A Guide to Project Management Body of Knowledge, Newton Square, Pennysylvania, USA.
Assessment: For each unit: Class Test (Two Hours) 20%; Assignment (report not exceeding 5000 words) 20%; Final examination (Three Hours) 60%.

VEE6052 PROJECT MANAGEMENT PROGRAM 1

Locations: Footscray Park.
Prerequisites: Nil.
Description: Project definition. Project management definition. Relationship to other management disciplines. Project phases. Project life cycle. Examples of project life cycle. Project stake holders. Organizational influences. Project management process. Initiating, planning, executing, controlling, and closing. Process iterations.
Credit Points:12
Learning Outcomes: On successful completion of this unit students are expected to be able to: 1. Plan and implement a project life cycle; 2. Integrate, plan and execute a project;
Class Contact: Thirty six (36) hours for one semester comprising of lectures, tutorials, seminars and group activities.
Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.
Assessment: Class Test (Two Hours) 20%; Assignment (report not exceeding 5000 words) 20%; Final examination (Three Hours) 60% Test, Class Test (Two Hours), 20%. Assignment, Assignment (report not exceeding 5000 words), 20%. Examination, Final examination (Three Hours), 60%.

VEE6053 PROJECT MANAGEMENT PROGRAM 2

Locations: Footscray Park.
Prerequisites:VEE6052 - PROJECT MANAGEMENT PROGRAM 1
Description: Project plan development and execution. Integrated change control. Project scope management. Initiation, scope definition, scope planning, scope verification, and scope change control. Project time management. Activity definition, activity sequencing, activity duration estimating, schedule development, and schedule control. Project cost management. Resource planning, cost estimating, cost budgeting, and cost control. Project quality management. Quality planning, quality assurance, and quality control, Project human resource management. Organizational planning. Staff acquisition. Team building. Project procurement management. Procurement planning, procurement solicitation, source selection, contract administration, and contract closure. Project communication management. Communication planning, information distribution, performance reporting, and administrative closure. Project risk management. Risk identification, qualitative risk analysis, quantitative risk analysis, risk management planning, risk response planning, risk monitoring and control.
Credit Points:24
Learning Outcomes: On successful completion of this unit students are expected to be able to: 1. Plan and implement a project life cycle; 2. Integrate, plan and execute a

project; 3. Implement cost management, risk and human resource management planning.
Class Contact: Seventy Two (72) hours for one semester comprising of lectures, tutorials, seminars and group activities.
Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.
Assessment: Class Test (Two Hours) 20%; Assignment (report not exceeding 5000 words) 20%; Final examination (Three Hours) 60% Test, Class Test (Two Hours), 20%. Assignment, Assignment (report not exceeding 5000 words), 20%. Examination, Final examination (Three Hours), 60%.

VEE8001 RESEARCH THESIS 1 FULL TIME

Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points: 48

VEE8002 RESEARCH THESIS 2 FULL TIME

Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points: 48

VEE8011 RESEARCH THESIS 1 PART TIME

Locations: Footscray Park, This unit is also available off-campus..
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem 3. expert cognitive, technical and creative skills to:

- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature

4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8. autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the College and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

VEE8012 RESEARCH THESIS 2 PART TIME

Locations: Footscray Park, This unit is also available off-campus..
Prerequisites: Nil.
Description: The Doctor of Philosophy (PhD) at Victoria University is VU's Doctoral Degree (Research) program, and qualifies individuals who acquire and apply a substantial body of knowledge to research, investigate and develop new knowledge, in one or more fields of investigation or scholarship. This unit contributes to the research student's progress towards the production of a thesis in an approved thesis format for independent examination by at least two external expert examiners of international standing. In this unit of study the student will be expected to demonstrate progress towards thesis completion as per the Learning Outcomes below.
Credit Points: 24

Learning Outcomes: On successful completion of this unit, the student will be able to demonstrate significant progress towards demonstration of: 1. expert understanding of a substantial body of theory and its practical application at the frontier of a field of work or learning, including substantial expert knowledge of ethical research principles and methods applicable to the field 2. intellectual independence and cognitive skills to undertake a systematic investigation, reflect critically on theory and practice and evaluate existing knowledge and ideas, including identifying, evaluating and critically analysing the validity of research studies and their applicability to a research problem 3. expert cognitive, technical and creative skills to:

- design, develop and implement a research project/s to systematically investigate a research problem
- develop, adapt and implement research methodologies to extend and redefine existing knowledge
- manage, analyse, evaluate and interpret data, synthesising key ideas and theorising within the context of key literature

4. expert communication skills to explain and critique theoretical propositions, methodologies and conclusions; to disseminate and promote new insights; and to cogently present a complex investigation of originality, or original research, both for external examination and to specialist (eg. researcher peers) and non-specialist (industry and/or community) audiences through informal interaction, scholarly publications, reports and formal presentations. 5. capacity to reflect on, develop and evaluate strategies for achieving their own learning and career goals. 6. intellectual independence, initiative and creativity in new situations and/or for further learning. 7. ethical practice and full responsibility and accountability for personal outputs. 8. autonomy, authoritative judgment, adaptability and responsibility as an expert and leading scholar.

Required Reading: To be determined in consultation with the supervisors.
Assessment: The student will demonstrate substantial progress towards completion of the research thesis through formal meetings with their thesis supervisors, who will provide formative feedback. The unit will be assessed by the supervisory team, the College and University through 6-monthly progress reports. Thesis, Research Thesis, Pass/Fail.

VEF1001 ENABLING SCIENCES 1A

Locations: Footscray Park.
Prerequisites: Nil.
Description: Basic algebra, including index, log laws, indicial and log equations, algebraic expansions; Functions, straight line, parabola, circle etc. Mod function. Domain, range, inverse functions; Trig. Functions and their graphs, period amplitude, degrees radians. Basic trig identities, Inverse Trig functions. Converting aCosx±bSinx to single Sin, Cosine terms; Limits, continuity, differentiation, rules, higher derivatives, Implicit differentiation. Tangents and Normals; Parametric differentiation, derivatives of logs and exponentials. Rates of change, maximum and minimum problems. Trig and inverse trig derivatives, logarithmic differentiation; Introduction to integration. Fundamental theorem of Integral Calculus. Substitution rule. Areas, Mean values, Root mean square; Methods of integration, partial fractions, simple integration by parts; Introduction to differential equations, separation of variables, population growth, air resistance; Complex numbers.Physical Units and Dimensions: Physical quantities, system of units and standards, dimensions, unit conversion, significant figures. Kinematics and Mechanics: Scalars and vectors, displacement, velocity and acceleration, motion in one and two dimensions, force, Newton's laws of motion, friction, work and energy, momentum and conservation laws, impulse and collisions, rotational motion, Waves: SHM, damped harmonic motion, forced oscillations and resonance, oscillatory motion, mechanical and acoustic waves, superposition and standing waves, Doppler effect, beats, sound intensity levels.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Perform basic differentiation and integration
- Calculate rates of change in maximum and minimum problems
- Perform integration by parts
- Use Newton's laws to calculate displacement, velocity and acceleration
- Apply the rules of conservation of energy and momentum.

Class Contact:60 hours of lectures/tutorials per semester.
Required Reading:D.Hughes-Hallett, A.Gleason, W.McCallum et al. Single and Multivariate Calculus. John Wiley and Sons, Inc. New York, 2005; Giancoli, D.C. Physics for Scientists and Engineers with Modern Physics, 4th Edition, 2008, Prentice Hall
Assessment: Class tests 30% End of semester examinations 70%

VEF1002 ENABLING SCIENCES 1B

Locations: Footscray Park.
Prerequisites:VEF 1001 Enabling Sciences 1A.
Description: Descriptive statistics, data, histograms etc. Describing data, mean, median, mode, quantiles, measures of dispersion; Introduction to probability, sample space, mutually exclusive and independent events. Intro to PDFs and intro. to Normal distribution; Normal distribution, mean of n variate values, 3,2,1 sigma confidence limits. Binomial, Poisson distributions; Exponential, Hypergeometric distr. Normal approx. to Binomial and Poisson. Sample mean. Central limit theorem; Determinants, matrices, Cramer's rule, inversion; Solution of systems of algebraic equations. Row operation, Gaussian elimination, echelon form, ranks; Newton Raphson, numerical integration. Midpoint, Trapezoidal and Simpsons rules; Introduction to series and some convergence tests; Simple power series and the Maclaurin series; Partial differentiation, algebraic, trig, exp, and log functions. Rules; Partial differentiation, conditions for max/min. Simple problems; Intro to second order constant coefficient, homogeneous D.s. Three types of solutions via the auxiliary equation.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Have an understanding of statistics including the Normal, exponential, Poisson and Hyper geometric distributions.
- Have an understanding of Electric and magnetic fields and calculate the forces acting on charged particles
- Understanding of wave/particle duality and the Bohr model of the atom.

Class Contact:60 hours of lectures/tutorials per semester.
Required Reading:D.Hughes-Hallett, A.Gleason, W.McCallum et al. Single and Multivariate calculus. John Wiley and Sons, Inc. New York, 2005; Giancoli, D.C. Physics for Scientists and Engineers with Modern Physics, 4th Edition, 2000, Prentice Hall.
Assessment: Class tests 30%. End of semester examinations 70%.

VEF1003 ELECTRICAL FUNDAMENTALS 1A

Locations: Footscray Park.
Prerequisites: Nil.
Description: Circuit Theory and Electronics: Basic concepts of electricity. KVL and KCL. Analysis of DC circuits using Nodal Voltage Method. Independent DC sources, ideal and practical. Resistors. Power of a signal and amplifiers. Dependent sources. Introduction to the operational amplifier and some application circuits. Resistive transducers. Volt-ampere characteristics. Thevenin and Norton's Theorems.

Capacitors. Transient responses of RC series circuits. Ideal diode. Simple rectifier circuits and power supplies.Number Systems and Codes: Base conversions, representation of data in the binary and hexadecimal systems, binary arithmetic, signed and unsigned values.Computer Programming: An overview of a typical computer system. The program creation process; editing, compiling and debugging. Data types, correct choice of type and their range. The use of variable, assignment, arithmetic and logical operations. Flow control using loops; if, while and switch statements. An Introduction to arrays.Digital Electronics: Logic gates, truth tables and Boolean algebra. Equation formation in Sum of Products and Product of Sums forms. Graphical methods of equation minimization including Venn diagrams and the Karnaugh map. Circuit implementation using universal gate sets.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- To have a basic understanding of the concepts, units and interrelationship between electric charge, voltage and power.
- To understand and be competent in the application of Kirchhoff's Laws for circuit analysis
- To be competent in the application of the Nodal Voltage Method, and the concept of equivalence (including Thevenin's and Norton's Theorems) to the solution of linear DC circuit analysis
- To understand the different types of gain, and input and output resistance of an amplifier
- To be able to analyse the following ideal operational amplifier circuit applications: inverting and non-inverting amplifier, buffer, inverting summer, comparator, and difference amplifier. To understand some of the uses of these circuits
- To understand how a dependent source may be used to model the finite voltage gain and finite input resistance of a real operational amplifier
- To understand that the operational amplifier voltage range is limited by the DC supply rails, and to appreciate that its gain is dependent upon the signal frequency
- To understand the differences between ideal linear and real resistors
- To understand from a components Volt-ampere characteristic whether or not the device can sink or source power, is linear or non-linear, is bilateral or non-bilateral
- To be able to use Volt-ampere characteristics to find the voltage, current or power of a component connected to a Thevenin Equivalent Circuit
- To understand the definition and units of capacitance. To know the physical nature of stray capacitance and of capacitors
- To be able to solve CR charge/discharge transient analysis problems. To appreciate some applications of this type of analysis
- To understand how a capacitor acts as an energy storage component
- To have a basic understanding of a TRU power supply, including ripple voltage calculations
- Write truth tables, construct logic expressions, and minimize expressions using Boolean algebra or Karnaugh map.
- Design and construct combinational logic circuits for simple applications. Write C++ program to solve simple problems that may include use of selection and repetition structures, create single dimensional arrays and store and manipulate data.

Class Contact:60 hours of lectures/tutorials per semester.
Required Reading: Ives, R Introduction to Electrical and Electronic Engineering, Victoria University; Savitch, W. Problem Solving with C++, 4th edition, 2004, Addison-Wesley.
Assessment: Class tests,30% End of semester examination 70%.

VEF1004 ELECTRICAL FUNDAMENTALS 1B

Locations: Footscray Park.
Prerequisites:VEF1003 Electrical Fundamentals 1A or equivalent.
Description: Circuit Theory and Electronics: Principle of Superposition. DC characteristics of real operational amplifiers. AC Circuit theory and some practical AC circuits. Phasors and complex impedance. Introduction to magnetism. Self-inductance. Transient & RC RL circuit responses. Resonance. Passive filters & bandwidth. AC characteristics of real operational amplifiers. Power in AC circuitsComputer Programming: Functions and function parameters. Text files and text strings. An introduction to data structures and classes.Digital Electronics: Latches and flip-flops, types, triggering, synchronous and asynchronous signals. Asynchronous counter design using flip-flop chains and manufacturer's devices. Multi-mode synchronous counter and state machine design. Electrical characteristics of logic devices.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- To be able to apply the Principle of Superposition to circuit analysis, and be aware of those circuits where it is not applicable
- To be able to convert data sheet characteristics of an IC amplifier into a network model. To be able to use the Principle of Superposition to examine the significance of these characteristics in linear applications of the amplifier
- To be able to analyse linear AC circuits
- To be able to calculate the RMS value of periodic waveforms
- To have gained an introductory understanding of electromagnetism sufficient to underpin the solution of circuits containing self-inductors
- To know the definition of resonance.
- To understand the behaviour of AC circuits both at resonance, and at frequencies either side of the resonant frequency
- To be able to convert freely between impedance and admittance, as required by given problems
- To be able to calculate the attenuation vs frequency response of first order passive filters
- To be able to calculate the various measures of power associated with AC power circuits
- To understand how given limitations of real operational amplifiers may manifest themselves in AC circuit applications
- Design and construct sequential logic digital circuits using D and J-K flip-flops.
- Use state diagrams and state tables for design.
- Write C++ programs using user defined functions and pointers and user defined data structures. Write/read data to/from text files.

Class Contact:60 hours of lectures/tutorials per semester.
Required Reading: Ives, R Electrical and Electronic Engineering, Victoria University.
Assessment: Class tests 30%. End of semester examination 70%.

VEF2001 LINEAR SYSTEMS AND MATHEMATICS 2A

Locations: Footscray Park.
Prerequisites:VEF1002 Enabling Sciences 1B and VEF1004 Electrical Fundamentals 1B
Description: Linear Systems: Analysis of linear time-invariant systems in time-domain. Zero-input response and zero-state response. Relationship between impulse response and transfer function. Poles and zeros and their significance. Analysis of linear time-invariant systems in frequency-domain. Frequency response and Bode diagrams.Mathematics: Laplace transformation and solution of ordinary linear differential equations with constant coefficients. Introduction to Fourier series and Fourier transforms. Elementary eigenvalue-eigenvector problems and solution of a set of ordinary linear first-order differential equations with constant coefficients.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- perform time-domain analysis of linear time-invariant systems using Laplace transforms,
- perform frequency-domain analysis of linear time-invariant systems using Fourier series and Fourier transforms,
- apply linear algebra to find trajectories of linear systems modelled as a system of first-order linear ordinary differential equations with constant coefficients,
- employ simple MatLab commands and Simulink to analyse linear time-invariant systems.

Class Contact: Linear Systems component: Three hours of lecture and problem solving per week for twelve weeks, for one semester. Total 36 hours.Mathematics component: Two hours of lectures and problem solving per week for twelve weeks, for one semester. Total 24 hours.
Required Reading: Linear Systems component:Alexander, C.K. and M.N.O. Sadiku, Fundamental of Electric Circuits, McGraw-Hill, 2004. Strum, R.D. and D.E. Kirk, Contemporary Linear Systems using MatLab. Brooks/Cole, 2000.Mathematics component: Kreyszig, E., Advanced Engineering Mathematics, John Wiley, 2006.
Assessment: This subject is designed to complement our Engineering Design subjects and as such will have significant formative assessment components. In addition there will be summative assessment in the form of multiple "skills audits" to account for 30% and end of semester examinations accounting for 70% of the total marks.The end of semester examinations include a three-hour Linear Systems Component Examination (accounting for 35% of the total marks) and a three-hour Mathematics Component Examination (accounting for 35% of the total marks).

VEF2002 SYSTEMS AND MATHEMATICS 2B

Locations: Footscray Park.
Prerequisites:VEF 2001 Linear Systems and Mathematics 2A
Description: Communication Systems: Communication systems and networks. Circuit switching, Cellular telephony systems and Internet. Communication signal analysis using Fourier series, Fourier transforms and convolution. Spectral standards and bandwidth calculations. Waveform distortion. Nyquist sampling theorem. Digital modulations: PCM, DPCM, DM.Control Systems: Feedback problems and their solutions. Low sensitivity design. Dynamic characteristics and closed-loop stability, algebraic stability tests. Introduction to PID controllers.Probability and Statistics: Probability theory. Random variables. Discrete distributions. Expected value, moment, and variance. Joint distribution. Conditional distribution. Normal distribution. Function of random variables. Maximum likelihood estimation. Confidence intervals and hypothesis testing. Random processes. Correlation, covarianace, and power spectrum.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- state and differentiate the purposes and requirements of communication systems and control systems,
- perform elementary time-domain and frequency-domain analyses of simple communication systems and control systems,
- employ simple MatLab commands and Simulink to analyse simple communication systems and control systems.

Class Contact:60 hours of lectures/tutorials per semester.
Required Reading: Systems component:Nise, N.S. Control Systems Engineering, John Wiley, 2003.Lathi, B.P. Modern Digital and Analog Communication Systems, Oxford University Press, 1998.Probability and Statistics component:Kreyszig, E., Advanced Engineering Mathematics, John Wiley, 2006.
Assessment: This subject is designed to complement our Engineering Design subjects and as such will have significant formative assessment components. In addition there will be summative assessment in the form of multiple "skills audits" to account for 30% and end of semester examinations accounting for 70% of the total marks. The end of semester examinations include a three-hour Systems Component Examination (accounting for 40% of the total marks) and a three-hour Probability and Statistics Component Examination (accounting for 30% of the total marks).

VEF2003 SYSTEMS AND APPLICATIONS 2C

Locations: Footscray Park.
Prerequisites:VEF1004 - ELECTRICAL FUNDAMENTALS 1B
Description: Content Analog Systems: PN diodes, electrical characteristics, applications. Zener diodes. Bipolar transistors, characteristics, small signal model analysis and design. MOSFET devices, characteristics, configurations and use in amplifier design. Voltage regulators, series and shunt types. Digital Systems: Data path elements including encoders, decoders, comparators, multiplexers, demultiplexers, multi-mode synchronous counters registers, shift-registers, arithmetic circuits and ROMs. Applications of data path elements. Data path element function, description in VHDL and synthesis onto programmable logic devices. Computer Programming: Pointers and the use of pointers in data storage, manipulation and data structures. The creation and use of “classes”. Binary files and random file input/output. An introduction to image processing using bitmap image files. Microprocessor Systems: The architectural structure of a simple 8-bit microprocessor/microcontroller. Program and data organization, programmers model, register sets, instruction set and addressing modes. Assembly language programming. Interfacing via external ports; timers, interrupts and special function peripherals.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:-

- Design and implement combinational and sequential data processing elements using VHDL with PLDs and manufacturers components.
- Analyse an engineering problem that requires a computational solution; construct suitable "classes" and functions for an algorithmic solution. Code and test the solution.
- Create the hardware and software requirements for an engineering task requiring a small microprocessor based system. Design, build and test the system including the hardware and software components.
- Analyse and design simpler rectifier based power supplies and small signal amplifiers.

Class Contact:60 hours of lectures/tutorials per semester.
Required Reading: Roth, C.H. Fundamentals of Logic Design, 5th edition, Thomson Learning, 2004. Sedra, A. and Smith, K, Microelectronic Circuits, 5th edition, Oxford University Press, 2004Savitch. W. Problem Solving wit C++, 4th Edn, 2004, Addison -Wesley Class Lecture Notes 2007.
Assessment: This subject is designed to complement our Engineering Design subjects and as such will have significant formative assessment components. In addition there will be summative assessment in the form of multiple "skills audits" to account for 30% and two 3 hour end of semester examinations accounting for 70% (35%+35%) of the total marks..

VEF2004 SYSTEMS & APPLICATIONS 2D

Locations: Footscray Park.
Prerequisites:VEF2003 - SYSTEMS AND APPLICATIONS 2C
Description: Analog Systems: Differential amplifiers, models of operation, gain, CMMR; design for performance characteristic. Frequency response of amplifiers; an introduction to wide-band and high frequency amplifier design. Oscillators, RC, LC, phase shift, integrator and crystal types. Data converters; dual-slope, successive approximation and "flash" type. Switching regulators and power supplies. Digital Systems: Synchronous state machine analysis and design. Moore and Mealy machines. State optimization and reduction techniques. Races and hazards; effects and elimination. An introduction to the algorithmic state machine; gate level synthesis and implementation in VHDL. Simple PLD architectures; macro cells, clocking and output options, limitations. Mechanical and Electromagnetic Fundamentals: Magnetic field, Faraday's Law and Lenz's Law, self and mutual inductors Transformers : Single phase transformer. The ideal and realistic transformer equivalent circuits, parameter estimation. Transformer performance: efficiency and voltage regulation. DC shunt motors.
Credit Points:12

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to:

- Analyse a range of circuit types and assess the circuit performance.
- Design circuits to meet performance criteria and select suitable components for circuit realization.
- Implement optimal state machines for a range of electronic engineering applications.
- Apply a system level approach to digital design using the algorithmic state-machine design paradigm.
- Be able to appreciate fundamentals of mechanical and electromagnetic energy conversion.
- Be able to analyse simple power systems containing DC machinesand transformers.

Class Contact:60 hours of lectures/tutorials per semester.
Required Reading: Roth, C.H. Fundamentals of Logic Design, 5th edition, Thomson Learning, 2004.Sedra, A. and Smith, K. Microelectronic Circuits, 5th edition, Oxford University Press, 2004Chapman, S. J. Electric Machinery and Power System Fundamentals, McGraw Hill 2002.Class Lecture Notes 2009.
Assessment: This subject is designed to complement our Engineering design subjects and as such will have significant formative assessment components. In addition there will be summative assessment in the form of multiple "skills audits" to account for 30% and two 3 hour end of semester examinations accounting for 70% (35%+35%) of the total marks.

VEG3001 ANALOGUE ELECTRONICS A

Locations: Footscray.
Prerequisites:VEF2003 Systems and Applications 2C
Description: This unit of study covers analogue electronic circuits analysis and design techniques commonly used in engineering systems. The unit is designed to provide support for students requiring knowledge of electronic circuits design in a concurrently studied Engineering Design unit. The subject includes the theory and implementation of feedback techniques for circuit stability. Differential amplifiers with active loads and multistage amplifiers. The design requirements of biquadratic filters, output stage/power amplifiers of an electronic systems. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent PBL exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- To have experience in performing analysis of most common circuits used in electronic systems.
- To have experience in performing design calculation of discrete electronic circuits used in different electronic systems.
- To learn feedback techniques required to insure stabilise function of electronic circuits.
- To learn some techniques required for frequency compensation of electronic circuits.
- To be able to use Multisim/Pspice, to analyse the behaviour of any electronic circuits and system.
- To be able to perform rapid prototyping of a specified electronic circuit.

Class Contact:2.5 hours per week consisting of lectures/tutorials and laboratory
Required Reading: Sedra A & Smith K. Microelectronic Circuits , 5th edition, Oxford University Press, 2004. Also extra materials to be provided upon commencement of subject, and dependent upon demands generated by any concurrent Engineering Design exercises.
Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination 65%, mid-semester test 15% and satisfactory performance of laboratory based exercises 20%

VEG3002 ANALOGUE ELECTRONICS B

Locations: Footscray.

Prerequisites:VEG3001 Analogue Electronics A.

Description: This unit of study covers analogue electronic Integrated Circuits functions and applications in electrical engineering systems. The unit is designed to provide support for students requiring knowledge of electronic circuits design in a concurrently studied PBL unit. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent PBL exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent PBL exercises. On successful completion of this unit, students are expected to be able to:

- Perform analysis of most common circuits used in electronic systems
- Perform design calculation of discrete electronic circuits used in different electronic systems;
- Use feedback techniques required to insure stabilise function of electronic circuits;
- Use techniques required for frequency compensation of electronic circuits;
- Use Multisim/Pspice, to analyse the behaviour of any electronic circuits and system;
- Perform rapid prototyping of a specified electronic circuit.

Class Contact:30 hours of class contact per semester. 2 hours of Lecture/Tutorial and 0.5 hours of laboratory exercises per week.

Required Reading: Sedra A & Smith K. Microelectronic Circuits , 5th edition, Oxford University Press, 2004.

Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination(65%), mid-semester test(15%) and satisfactory performance of laboratory based exercises(20%). Evaluation of CGA in unit(as %): Level 1(%) Level 2(%) Level 3(%) Problem Solving 10 30 10 Using Information 10 30 10 Communication Oral 0 0 0 Communication Written 0 0 0 Professional - Autonomous 0 0 0 Professional - Collaborative 0 0 0 Social & Cultural Diversity 0 0 0

VEG4100 DIGITAL SIGNAL PROCESSING A

Locations: Footscray Park.

Prerequisites:VEF2001 Linear Systems and Mathematics 2A

Description: Introduction Continuous-time and discrete-time signals. The sampling theorem. Impulse sampling and the zero-order hold. The z-transform.Analysis of discrete-time systems Unit-pulse response. Causal linear shift-invariant systems. Ordinary convolution. Bounded-input bounded output stability. Difference equation and transfer pulse transfer function. Unit-delay operator and realization structures of causal linear shift-invariant systems. A stability test. The frequency response function The discrete-time Fourier transform pairs. Mapping between the s-plane and the z-plane. Infinite duration Impulse Response filters Butterworth and Chebyshev filters. Frequency scaling and transformations. Transformation of analog filters into IIR filters. Matched z-transform, impulse-invariance, and bilinear transformations. Finite duration Impulse Response filters Linear phase response. Filter design with window functions. Frequency sampling filters. The Discrete-Time Fourier transform Relationship between DFT and DTFT. The Fast Fourier transform. Computation of frequency spectra, zero padding. Cyclic convolutions and its application in filter realization.

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- perform time and frequency domain analysis of discrete-time linear signal processing systems,
- design simple FIR and IIR filters,
- perform spectral analysis on sampled signals with DFT via FFT.

Class Contact:30 hours class contact comprising 24 hours of lectures/tutorial and 6 hours of laboratory.

Required Reading:E.C. Ifeachor and B.W. Jervis, Digital Signal Processing - A Practical Approach, Prentice Hall, 2002.

Assessment: Laboratory assessment 30%; End of semester examination 70%.

VEG4101 PROFESSIONAL PRACTICE 4A

Locations: Footscray Park.

Prerequisites:VEB3200 - ENGINEERING DESIGN AND PRACTICE 3B

Description: Professional Engineering Ethics. Engineers Australia Code of Ethics, IEEE Code of Ethics. Standards, codes of practice, and statutory requirements for the profession. Social responsibility. Environmental and sustainability considerations in engineering design and management. The role of the engineering institutions. Lifelong professional development, networking, contributing to the community. Basic business principles. Accounting, book keeping methods. Depreciation. Taxation. Understanding company reports. Career choices: (i) working for a salary small company or large company? Developing a long term career plan. Career choices: (ii) starting your own business consulting, trading, manufacturing. Innovation and enterprise. (Note: This topic will be developed in more detail in VEG4202). Writing an effective resume and job application. Winning at the job interview. Interview training. Mock job application, mock job interview, with oral and video evaluation and feedback.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Discuss the interactions between engineering systems and their social, cultural, environmental, economic and political context;
- Discuss the role of engineering in society;
- Display a commitment to professional and ethical responsibilites;
- Explain the need for lifelong learning and professional development;
- Interact with people in other disciplines and professions to broaden knowledge, and to achieve multidisciplinary outcomes with a properly integrated engineering contribution;
- Describe general business principles currently in operation;
- Describe the process of applying for jobs and the process of selection.

Class Contact: Sixty (60) hours or equivalent for one semester comprising formal and informal class work.

Required Reading: There are no prescribed readings for this unit. Students will be guided by the unit co-ordinator to material relevant to the unit.

Assessment:A series of assignments (class exercises and projects), tests and examination (100%).

VEG4202 PROFESSIONAL PRACTICE 4B

Locations: Footscray Park.

Prerequisites:VEB3200 - ENGINEERING DESIGN AND PRACTICE 3BVEG4101 - PROFESSIONAL PRACTICE 4A

Description: Starting a business. Assistance from government agencies (for example: www.business.gov.au) Marketing principles, market research. Advertising. Writing a business plan. Registration & licences. Obtaining finance. Sources of venture capital. Importing and exporting. Regulatory and commercial considerations. Using agents and distributors. Cost estimating. Time estimating and management. Tendering. Meeting mandatory conditions in tenders. Risk management. Insurance. Contracts. Project Management techniques. Leadership and managing staff. Leadership styles. Program Evaluation and Review Technique (PERT) and the Critical Path Method (CPM) techniques. Gantt charts for scheduling. Monitoring and controlling the project. Intellectual property. Copyright. Patents. Searching patents, obtaining a patent. Licensing. Franchising. Safety in the workplace. Legislated health and safety requirements. Workcover insurance. Standards and codes of practice. Product compliance requirements (for example: Australian Standards - electrical safety standards, EMC compliance requirements). Quality control.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Explain the current commercial, legal and regulatory environment in which the professional engineer works;
- Describe the legal and regulatory requirements for starting a business;
- Describe how to prepare a business plan;
- Explain the financial system, the way financial institutions operate, and the requirements for successfully securing funding;
- Explain how to participate in the tendering process, and manage risk in tendering;
- Discuss intellectual property issues, and methods of protecting intellectual property;
- Explain how to use project management techniques as applied to an engineering undertaking;
- Discuss the importance of workplace safety, and its regulatory and insurance aspects.

Class Contact: Sixty (60) hours or equivalent for one semester comprising formal and informal class work.

Required Reading: There are no prescribed readings for this unit. Students will be guided by the unit co-ordinator to material relevant to the unit.

Assessment:A series of assignments (class exercises and projects), tests and examination (100%).

VEH3001 DIGITAL SYSTEM DESIGN A

Locations: Footscray.

Prerequisites:VEF2004 - SYSTEMS & APPLICATIONS 2D

Description: Design simple and complex asynchronous state machines and implement them on PLDs. Apply a sound technical design approach, manage the design complexity in an efficient manner and implement the solution with modern software development tools and devices.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Design and implement a digital system containing of the order of 20,000 logic gate elements.
- Apply a sound technical design approach, manage the design complexity in an efficient manner and implement the solution with modern software development tools and devices.

Class Contact:30 hours of class contact. 2.5 hours per week - 2 hours lecture/tutorial and 0.5 hours laboratory work integrated with VEB3002 as experimental workshop..

Required Reading: Roth, C.H. Fundamentals of Logic Design, 5th edition, Thomson Learning, 2005.

Assessment: End of semester examination 70%, a mid-semester test and assignments 20% and laboratory 10%.

VEH3002 DIGITAL SYSTEM DESIGN B

Locations: Footscray.

Prerequisites:VEF2004 - SYSTEMS & APPLICATIONS 2D

Description: Need for Asynchronous FSMs. Models of Asynchronous FSMs. Analysis of Asynchronous Circuits. Timing problems - critical and non-critical races, cycles, static and essential hazards. Design of Asynchronous Machines - hazard-free, one-hot designs. One-hot Asynchronous Sequencers.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Design simple and complex asynchronous state machines and implement them on PLDs.
- Apply a sound technical design approach, manage the design complexity in an efficient manner and implement the solution with modern software development tools and devices.

Class Contact:30 hours of class contact. 2.5 hours per week - 2 hours lecture/tutorial and 0.5 hours laboratory work.

Required Reading: Tinder, R.F. Engineering Digital Design, 2nd Edition Academic Press, 2005.

Assessment: End of semester examination 70%, a mid-semester test and assignments 20% and laboratory 10%.

VEH3003 EMBEDDED COMPUTER SYSTEMS DESIGN

Locations: Footscray.

Prerequisites:VEF2003 - SYSTEMS AND APPLICATIONS 2C

Description: This unit of study provides an introduction to microprocessor embedded systems design and to provide support for students requiring knowledge of embedded systems in a concurrently studied Engineering Design unit. The aim of the unit is to extend students knowledge of microprocessor systems into embedded applications using a high level language. Hardware and software system aspects are considered along with means of managing system complexity. In addition to lectures and tutorials the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, it is expected that students will be able to :

- design, build and implement an embedded system using a modern microcontroller,
- code in a high level language that interfaces to appropriate signal acquisition and actuating devices and meets performance requirements in terms of functionality (logical and timing) and cost.

Class Contact:30 hours of class contact. 2 hours of Lecture/Tutorial and 0.5 hours of laboratory work per week.

Required Reading: Microchip Corporation. Complete Mid-range Reference Manual; 2004 Microchip Corporation. Complete PIC18C Reference Manual; 2006

Assessment: End of semester examination (80%). Mid-semester test laboratory (20%

VEH3004 REAL TIME AND MULTITASKING COMPUTER SYSTEMS

Locations: Footscray.

Prerequisites:VEH3003 - EMBEDDED COMPUTER SYSTEMS DESIGN

Description: This unit of study provides an introduction to real time multitasking systems through the use of a real time kernel and to provide support for students requiring knowledge of embedded systems in a concurrently studied Engineering Design unit. The aim of the unit is to extend student s knowledge of computer systems into time critical and very complex applications using a structured design approach and the use of a real time kernel. Hardware and software system aspects are considered along with means of managing system complexity. In addition to lectures and tutorials the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- analyse a complex embedded computer control task and formulate a multitasking solution, and
- implement the solution using a high level language, supported by a commercial real time kernel.

Class Contact:30 hours of class contact. 2.5 hours per week - 2 hours lecture/tutorial and 0.5 hours laboratory work.

Required Reading: Pumpkin Inc; SALVO Reference Manual; 2005. Microchip Corporation. Complete PIC18C Reference Manual; 2006.

Assessment: End of semester examination 80% and a mid-semester test and laboratory 20%.

VEH4001 COMPUTER SYSTEMS ON AN ASIC

Locations: Footscray.

Prerequisites:VEH3004 - REAL TIME AND MULTITASKING COMPUTER SYSTEMS

Description: This unit of study integrates the entire computer engineering (hardware and software) knowledge from earlier years of study. The aim of the unit is for the students to learn how to bring together one (or more) microprocessors, memory blocks (containing a C++ real time program), I/O blocks and the student s designed special purpose devices onto a single VLSI device. Managing the design of complex systems, the manufacturing pathway to mass production and economic considerations are also included. The unit also provides support for students requiring knowledge of this area of digital systems in a concurrently studied Engineering Design unit. Consequently, the syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Design and implement a single chip digital system containing multiple microprocessors and dedicated hardware operating multiple tasks in a real-time manner.
- Other outcomes will be in the management of design complexity for 1 million+ gate designs, economic and manufacturing considerations.

Class Contact:30 hours of class contact consisting of 2.5 hours per week - 2 hours lecture/tutorial and 0.5 hours laboratory work per week.

Required Reading: Provided notes to support lecture program. Labrosse, J. J. MicroC/OS II The Real Time Kernal, 2nd edition, CMP ,2002.

Assessment: End of semester examination 80%, a mid-semester test and laboratory 20%.

VEH6001 HDL AND HIGH LEVEL SYNTHESIS

Locations: Footscray Park.

Prerequisites:VEF2004 - SYSTEMS & APPLICATIONS 2D

Description: In this unit the students will be exposed to hardware modeling and advance design and optimization technique using HDL and/or Verilog languages. Students will be able to develop experience in circuit design using FPGAs and industry standard EDA tools. The design covers high level synthesis, optimization, verification and implementation techniques.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Design Integrated Circuit using Hardware Description Language (VHDL) and or Verilog 2. Generate the Architectural-level Synthesid of selected problems 3. Synthesis Field Programmable Gate Array (FPGA) for a problem 4. Develop High level optimisations of the designed problem 5. Generate standard Coding of the designed problem 6. Utilise Industry Standard Electronic Design Automation (EDA) tools for the design.

Class Contact: Sixty hours (60) for one semester comprising lectures, laboratory exercises and project work.

Required Reading: Ewout S. J. Martens; Georges Gielen; 2008. High-level modeling and synthesis of analog integrated systems USA, Springer

Assessment: Project, Project (3000 words), 50%. Laboratory Work, 4 Laboratory Exercises (300 words per report), 20%. Examination, End of semester examination (2 hours), 30%. Project covers Learning Outcomes 1,2,4,5,6 and Graduate Capabilities 1,2,3,4,6 Laboratory covers Learning Outcomes 1 to 6 and Graduate Capabilities 1,2,4,5,6 Examination covers Learning Outcomes 1 to 6 and Graduate Capabilities 1, 2.

VEH6002 IC DESIGN

Locations: Footscray Park.

Prerequisites:VEF2004 - SYSTEMS & APPLICATIONS 2D

Description: This unit introduces IC design techniques based on MOS and micron technology with emphasis on digital system design. The students will be using Industry Standard EDA tools to develop skill in VLSI circuit design including Modelling, simulation, verification, layout and testing.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Utilise Integrated Circuit (IC) design techniques 2. Utilise Circuit optimisation techniques 3. Utilise Application Specific Integrated Circuit (ASIC) and custom design techniques 4. Design of Very Large Scale Integration (VLSI) system, sub-systems 5. Design tradeoffs-cost, power and performance

Class Contact: Sixty Hours (60) hours for one semester comprising lectures, laboratory exercises and project work.

Required Reading: Rabaey, J.M., Chandrakasan, A., Nikolic, B. 2003 2nd edition Digital Integrated Circuits - A Design Perspective NJ: Prentice Hall.

Assessment: Laboratory Work, 4 laboratory exercises (300 words per report),, 20%. Project, project (3000 words), 50%. Examination, final examination (2 hours), 30%. Laboratory covers learning outcomes1, 2,3,4, and Graduate capabilities 1,2,4,5 Project covers learning outcomes 2,3,4,5 and Graduate capabilities 1,2,4,5,6 Examination covers learning outcomes1, 2,4 and Graduate capabilities 1, 2. .

VEH6003 EDA TOOLS AND DESIGN METHODOLOGY

Locations: Chipskills Partner Universities.

Prerequisites:VEF2004 - SYSTEMS & APPLICATIONS 2D

Description: This unit will familiarize the students with EDA design flow environment, and embedded development tools for analog and digital applications (Specific Integrated Circuits ASIC). The design flow covers full and semi custom IC design and mixed signal design.

Credit Points:12

Learning Outcomes: On successful completion of this unit, the students are expected to be able to: 1- Utilise the EDA design flow environment for all IC design 2- Apply Back-end IC design flow and tools to all design 3- Apply Front-end IC design flow and tools to all design 4- Implement Functional design and verification in all design 5- Utilise the Mixed signal design flow for all design.

Class Contact: Sixty hours for one semester comprising lectures, laboratory/workshop and project.

Required Reading: Chang, H., Cooke, L., Hunt, M., Martin, G., McNelly, A. and Todd, L, (2004) Surviving the SOC Revolution - A Guide to Platform-Based Design San Francisco: Kluwer Academic.

Assessment: Assignment, Assignment (1500 words), 20%. Project, Research project (3000words), 50%. Laboratory Work, 3 laboratory reports (3 x 500words), 30%. Assignment assessment covers learning outcomes 1 to 3 and Graduate Capabilities 1 to 4 Research project covers learning outcomes 1 to 5 and Graduate Capabilities 1 to 4 and 6 Laboratories cover learning outcome 2, 3,4 and Graduate Capabilities 1,2,4 .

VEH6004 DIGITAL SYSTEM DESIGN

Locations: Footscray Park.

Prerequisites:VEH6001 - HDL AND HIGH LEVEL SYNTHESISOR equivalent.

Description: This unit will enable students to understand and apply digital system design techniques using Industry Standard tools. The unit covers several circuit analysis and design including state machine design approach, RTL design techniques for advanced micro based design.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit of study the students are expected to have:

- Apply industry standards to digital system design methodologies
- Generate VHDL coding for synthesis of data structure and state machines and advanced timing issues in high speed digital systems
- Developed skills in the use of EDA design tools for digital system design
- Evaluate the self-timed logic for Advanced Micro based design techniques.

Class Contact: Four hours per week for one semester comprising of lectures and laboratory exercises.

Required Reading: Roth C.H. 2008 Digital Systems Design using VHDL US: Thomson

Assessment: Laboratory Work, 3 laboratories (600 word per report), 30%. Project, Individual Project (2500 word per project), 40%. Examination, Two hours, 30%. Project covers learning outcomes 2 , 3 and graduate capabilities 1 to 6 Laboratories cover learning outcome 1, 2, 3 and graduate capabilities 1 to 4 Examination covers learning outcomes 1, 2 3 and graduate capabilities 1, 2 .

VEH6006 EMERGING TOPICS IN IC DESIGN

Locations: Chipskills Partner Universities.

Prerequisites: Nil.

Description: New technologies such as: Silicon carbide high-power devices, Quantum based devices, quantum wells and quantum dots Nanometer MOSFETSs, Wide bandgap materials and devices, Plasma-wave electronics, Ferroelectric devices. Overview of new process technologies. Deep sub-micron technology and noise. Ultra-high-speed devices, including microwave and optical devices. New Systems-Level Architectures, such as: Nanowire arrays, Neuromorphic architectures, Reconfigurable architectures, Wafer-scale systems, Memory systems. New EDA tools and future technology projections. EMC: regulations, measurement and testing, Design issues related to EMC.

Credit Points:12

Class Contact: Four hours per week for one semester comprising two hours per week lectures and two hours per week of workshops and seminars.

Required Reading: Dimitrijev, S., 2000, Understanding Semiconductor Devices, Oxford University Press. Appropriate Journal Papers.

Assessment: Assignments, 30%; seminars, 40%; and research project, 30%.

VEH6007 ADVANCED VLSI DESIGN

Locations: Chipskills Partner Universities.

Prerequisites:VEH6002 - IC DESIGNOR equivalent.

Description: This unit allows the students to develop and apply advanced integrated design techniques based on their previous work in the Basic Integrated Circuit Design and EDA tools units. The design techniques are based on full-custom design tools to generate circuit layout, rule checking, verification and simulation.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply IC design techniques to solve problem

- Utilise Circuit optimisation techniques in circuit design
- Evaluate ASIC and custom design techniques in the design of an advance digital system
- Implement Advanced Design of VLSI system, sub-systems for specific problems
- Design tradeoffs-cost, power and performance.

Class Contact: Forty Eight hours for one semester comprising lectures, laboratory/workshop and project.
Required Reading: Rabaey, J.M., 2003, Digital Integrated Circuits - A Design Perspective San Diego: Prentice Hall.
Assessment: Project, Individual project (3000 words), 50%. Examination, 2 hours examination, 30%. Laboratory Work, 3 Laboratories (500 words per report), 20%. Project covers learning outcomes 1,2,4, 5 and graduate capabilities 1 to 5 Laboratories cover learning outcome 2, 3, 4 and graduate capabilities 1 to 4 Examination covers all learning outcomes and graduate capabilities 1 and 2. .

VEH6008 VLSI DIGITAL SIGNAL PROCESSING SYSTEMS

Locations: Chipskills Partner Universities.
Prerequisites:VEG4100 - DIGITAL SIGNAL PROCESSING A
Description: Overview of DSP: FFT, DFT, Z-transform and sampling theory. FIR and IIR filter design and implementation. Interpolation, decimation and multi-rate systems. Adaptive filtering and applications. DSP software building blocks, nonlinearity and choice of sampling rate. DSP hardware: architecture, processing blocks (multipliers, ALU, MAC, barrel shifters). Pipelining and parallel processing, power consumption and reduction. Folding and unfolding applications: sampling period reduction, designing digit-serial hardware, time-multiplexed design. Systolic array design. Algorithmic strength reduction. Advanced DSP software and hardware. DSP system design.
Credit Points:12
Class Contact: Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises and project.
Required Reading: Keshab, K.P., 1999, VLSI Digital Signal Processing Systems: Design and Implementation, Jacaranda Wiley. Appropriate IEEE/IEE Journal Papers.
Assessment: Assignment and laboratory exercises, 30%; project, 40%; and final examination, 30%.

VEH6009 RELIABILITY AND TESTABILITY IN IC DESIGN

Locations: Footscray Park.
Prerequisites:VEH6001 - HDL AND HIGH LEVEL SYNTHESISVEH6003 - EDA TOOLS AND DESIGN METHODOLOGY
Description: In this unit students will have the opportunity to identify and apply techniques required for the design of Integrated Circuits with facilities for testing for reliability. This will include a particular focus on redundancy and fault tolerance; functional and formal verification on fault modelling; hardware/software co-design, and timing and power analysis.
Credit Points:12
Learning Outcomes: Upon successful completion of this unit of study, students are expected to be able to: 1. Understand reliability issues and apply these to microelectronic devices and integrated circuits. 2. Design circuit for testability of integrated circuits. 3. Implement and apply knowledge of fault modelling and testing methodologies to the design of integrated circuits 4. Demonstrate the application of testability on a systems level 5. Employ the Electronic Design Automation (EDA) design to test tools including automatic test pattern generation.
Class Contact: Sixty (60) hours per week for one semester comprising lectures and laboratory exercises.
Required Reading: Lala, P.K., 2002 Digital Circuit Testing and Testability, MO: Academic Press.
Assessment: Assignment, Assignment (2500 words), 25%. Laboratory Work, 3 laboratory exercises, (500 words plus calculations, diagrams and Tables), 35%. Examination, final examination (2 hours), 40%. Assignment covers learning outcomes 2,3,4 and Graduate capabilities 1,2,3,4,5 Laboratory covers learning outcomes 3,4,5 and Graduate capabilities 1 to 6 Examination covers learning outcomes 1 to 4 and Graduate capabilities 1, 2. .

VEH6010 INTRODUCTION TO MICROSYSTEM TECHNOLOGY

Locations: Chipskills Partner Universities.
Prerequisites: Nil.
Description:MOS and MEMS processes. Bulk and surface silicon micromachining. LIGA techniques. Analog and digital interfacing circuits and sensors. EDA tools for MEM design and implementation. MEMS device modelling. Packaging issues. Replication processes. Hybrid design methodology and techniques.
Credit Points:12
Class Contact: Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises.
Required Reading: Maluf, N., 2000, An Introduction to Microelectromechanical Systems Engineering, Artech. Appropriate Journal Papers.
Assessment: Assignments, 20%; laboratory exercises, 30%; project, 30 and final examination, 20%.

VEH6011 INTRODUCTION TO SEMICONDUCTOR DEVICE FABRICATION

Locations: Chipskills Partner Universities.
Prerequisites: Nil.
Description: Fundamental principles of fabrication processes, physical and chemical models for crystal growth, oxidisation, ion implantation, etching, deposition, lithography and metallisation. Emphasis is on practical aspects of silicon device fabrication, including wafer cleaning, photolithography, etching, oxidation, diffusion, ion implantation, chemical vapour deposition, physical sputtering and wafer testing. Imperfections in semiconductors, crystal growth, solid solubility, alloying and diffusion, ion implantation, oxide masking, and epitaxy. Practical and fundamental limits to the evolution of the technology of MOS and bipolar devices. How are integrated circuits fabricated and what future changes are likely? The implications for device performance caused by material properties and fabrication techniques. Fabrication techniques for bipolar and MOS-devices, and the electrical performance of devices based on these techniques. Comparison of fabrication technologies for silicon and gallium arsenide devices. Processes and fabrication equipment to be studied will include oxidation/diffusion, CVD reactors, photolithography, plasma etching, vacuum evaporator, ion implantation, etc. Introduction to computer modelling of processing steps such as etching., lithography, diffusion, implantation (eg SUPREME).
Credit Points:12
Class Contact: Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises.
Required Reading: Levinshtein, M. and Shur, M., 1997, Semiconductor Technology: Processing ad Novel Fabrication Techniques, John Wiley. Appropriate Journal Papers.
Assessment: Assignments, 20%; laboratory exercises, 30%; and final examination, 50%.

VEH6013 PROJECT MANAGEMENT AND ENTREPRENEURSHIP

Locations: Chipskills Partner Universities.
Prerequisites: Nil.

Description: Quality standards and compliance issues. Managing QA. Human Resources issues. Occupational Health and Safety requirements. Overview of project management strategy, project life cycle, scope, integration, scheduling, risks, budget, etc. Creativity and innovations. Business plans. IP issues and commercialisation process. Entrepreneurial organisation and strategy. Venture capital and marketing. Case studies.
Credit Points: 12
Class Contact: Four hours per week for one semester. Assessment Assignments, 20%; seminar presentations, 10%; project, 30%; and final examination, 40%.
Required Reading: Current available text book - students to be advised. Appropriate journal papers.

VEH6014 RF AND MIXED SIGNAL DESIGN

Locations: Footscray Park.
Prerequisites: VEG3001 - ANALOGUE ELECTRONICS A
Description: This unit covers the basic concepts of wireless communication systems design including transceiver architectures and layout techniques, LNAs, oscillators, mixers, and phase detectors. Students will also learn how to design low voltage low power integrated circuits, design flow for analog and mixed signal circuits and systems utilising industry standard Electronic Design Automation (EDA) tools.
Credit Points: 12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Analyse/Design and Layout wireless Transceivers 2. Design and Implement Low Noise Amplifiers and Oscillators 3. Design Mixed signal systems including Analog to Digital/Digital to Analog converters.
Class Contact: Four hours per week for one semester comprising two hours per week lectures and two hours per week of laboratory exercises and project.
Required Reading: Farag, E.N. and Elmasry, M.I., (1999), Mixed Signal VLSI Wireless Design: Circuits and Systems NY: Kluwer
Assessment: Laboratory Work, Three reports (500 words per report plus calculations, Diagrams and Tables), 30%. Project, 3000 words project report, 40%. Examination, Two hours examination, 30%. Project covers learning outcomes 3 and Graduate capabilities 1,2,3 and 4 Laboratory covers learning outcomes 1, 2 and Graduate capabilities 1,2 and4 Examination covers learning outcomes 1-3 and Graduate capabilities 1, 2 and 6 .

VEH6016 VERILOG HDL

Locations: Footscray Park.
Prerequisites: VEF2004 - SYSTEMS & APPLICATIONS 2D
Description: The role of HDL in design, Top-down introduction to Verilog, Verilog for description of logic circuits, Verilog language constructs, behavioural modelling, logic level modelling, concurrent process and switch level modelling. Timing analysis, synthesis and test benches.
Credit Points: 12
Class Contact: four hours per week for one semester, comprising of two hour lecture and two hours of tutorial/laboratory and project work.
Required Reading: Thomas, D.E and Moorby, P.R., 1998, The Verilog Hardware Description Language, Kluwer.
Assessment: Assignments and laboratory exercises, 20%; project, 30%; final examination, 50%.

VEH6017 DIGITAL SYSTEM DESIGN WITH VERILOG HDL

Locations: Footscray Park.
Prerequisites: VEH6001 - HDL AND HIGH LEVEL SYNTHESISVEH6016 - VERILOG HDL
Description: Introduction to Verilog and digital systems design for VLSI, combinational and sequential circuits, design verification, algorithmic state machine design, finite state machine specifications in Verilog, hierarchical modelling concepts, synchronous and asynchronous systems, pipelined architectures, processor architectures, clocks timing and clock distribution, synthesis and advanced concepts in brief.
Credit Points: 12
Class Contact: four hours per week for one semester, comprising of two hour lecture and two hours of tutorial/laboratory and project work.
Required Reading: Palnikar, S. & Goel P., 2003, Verilog HDL: A Guide to Digital Design and Synthesis, Prentice Hall PTR.
Assessment: Assignments and laboratory exercises, 35%; project, 33%; final examination, 30%.

VEH6018 ANALOG & MIXED SIGNAL DESIGN

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit will provide students with opportunities to design analog and mixed signal integrated circuits using CMOS technology of which noise and performance analysis and design trade-off will be an integral part. These designs required to subscribe to Industry Standard Electronic Design Automation (EDA) tools.
Credit Points: 12
Learning Outcomes: Upon successful completion of this unit of study, students are expected to be able to: 1. Design high speed amplifiers utilizing low power techniques 2. Develop functioning Sample and Hold circuits 3. Design comparators for Analog to Digital converters 4. Design a Digital to Analog and an Analog to Digital converter 5. Conduct noise and performance analysis on mixed signal circuits.
Class Contact: Five hours per week for one semester, comprise of two hours lecture and three hours of laboratory and project work.
Required Reading: Razavi, B., (2001) Design of analog CMOS integrated circuits NY: McGraw Hill International
Assessment: Laboratory Work, 3 Laboratory reports (500 words plus calculation, diagrams and tables), 20%. Project, Project (5000 words), 50%. Examination, Final examination (2 hours), 30%. Project covers learning outcomes 3,and 4 and Graduate capabilities 1,2,3,4, and 5 Laboratory covers learning outcomes 1 to 3 and Graduate capabilities 1 to 4 Examination covers learning outcomes 1 to 5 and Graduate capabilities 1, 2 and 6. .

VEH6020 MINOR PROJECT

Locations: Chipskills Partner Universities.
Prerequisites: VEH6001 - HDL AND HIGH LEVEL SYNTHESISVEH6002 - IC DESIGNVEH6003 - EDA TOOLS AND DESIGN METHODOLOGY
Description: It is expected that the majority of industry-based students will undertake projects as part of their normal employment, where relevant opportunities exist and suitable resources and supervision can be guaranteed. A project can be structured to be the equivalent of two units of study. Projects would b expected to demonstrate a good working knowledge in chip design and implementation. Students must demonstrate their ability to integrate and draw upon their coursework studies relevant to the project. A dissertation of no less than 10000 words must be submitted and will be examined by one examiner selected by the examining panel for this module. Commercial in-confidence programs can be undertaken, with appropriate restrictions on publication and choice of examiners. Intellectual property of projects initiated by a company and undertaken in that company will remain with the company. All other projects will be subject to the Intellectual Property policy of the relevant university partner.
Credit Points: 24
Class Contact: Eight hours per week for one semester.

Required Reading: Current available text - students to be advised. Appropriate IEEE/IEE Journal materials.
Assessment: Assessment will be based on project progress and demonstration, 20%; Final project demo 30%; final report, 40% and an oral poster presentation, 10%.

VEH6030 MAJOR PROJECT

Locations: Chipskills Partner Universities.
Prerequisites:VEH6001 - HDL AND HIGH LEVEL SYNTHESISVEH6002 - IC DESIGNVEH6003 - EDA TOOLS AND DESIGN METHODOLOGY
Description: It is expected that the majority of industry-based students will undertake projects as part of their normal employment, where relevant opportunities exist and suitable resources and supervision can be guaranteed. Collaboration with international partners will also be encouraged. A project can be structured to be the equivalent of four units of study. Projects would be expected to demonstrate mastery in chip design and implementation at a level considered no less than that of an experienced practitioner in the field. Students must demonstrate their ability to integrate and draw upon their coursework studies relevant to the project. A dissertation of no less than 15000 words must be submitted and will be examined by two examiners selected by the examining panel for this module. Commercial in-confidence programs can be undertaken, with appropriate restrictions on publication and choice of examiners. Intellectual property of projects initiated by a company and undertaken in that company will remain with the company. All other projects will be subject to the Intellectual Property policy of the relevant university partner.
Credit Points:48
Class Contact: Sixteen hours per week for one semester. Assessment Assessment will be based on project progress and demonstration, 20%; Final project demo 30%; final report, 40% and an oral poster presentation, 10%.
Required Reading: Current available text - students to be advised. Appropriate IEEE/IEE Journal materials.

VEH6101 ASIC DESIGN TECHNIQUES

Locations: Footscray Park.
Prerequisites: Nil.
Description: Introduction and project overview: Use of Mentor Graphics and Summit IC Design tools. System design: Behavioural simulations. RTL design. ASM design. Development of gate level designs. Autoplacement and autorouting. Back-annotation. and resimulation. Program gate array and test.
Credit Points:12
Class Contact: Four hours per week for one semester comprising one hour per week of lecture and three hours per week of tutorial/laboratory.
Required Reading: Selected papers from IEEE/IEE Journal. To be advised by the lecturer.
Assessment: Assignments 20%; Research Project 80%.

VEH6102 CUSTOM IC DESIGN B

Locations: Footscray Park.
Prerequisites:VEH6121 - BASIC IC DESIGN/DEVICES
Description: The students will use modern integrated CAD software to accomplish schematic capture, simulation, layout, extraction, place and route and design verification. Mixed analog/digital system specification. Design and simulate circuit using schematic capture tools and HSPICE. Use of Mentor Graphics. Full-custom design tools to generate circuit layout, design rule checking, design verification and simulation. Input/output pads. Layout generators. Layout analysis. Placement and routing. Testing.
Credit Points:12
Class Contact: Four hours per week for one semester comprising one hour per week of lecture and three hours per week of project
Required Reading: Selected papers from IEEE/IEE Journal. To be advised by the lecturer.
Assessment: Assignments, 20%; Project, 80%.

VEH6111 DIGITAL CIRCUIT DESIGN

Locations: Footscray Park.
Prerequisites:VEF2004 - SYSTEMS & APPLICATIONS 2D
Description:ASM design approach, Synthesis by programmable devices. Asynchronous systems: Micropipelines, Asynchronous microprocessor. RISC architectures and the influence on VLSI technology. Parallel processing structures. Artificial neural networks. VLSI processor arrays. Content addressable and associated memories. Systolic and wavefront arrays. Application driven architecture.
Credit Points:12
Class Contact: Four hours per week for one semester comprising two hours per week of lecture and two hours per week of tutorial/laboratory.
Required Reading: Mano, M.M. and Kime, C.R., 1997, Logic and Computer Design Fundamentals, Prentice Hall.
Assessment: Assignments and laboratory exercises 30%, Project 40%; final examination 30%.

VEH6121 BASIC IC DESIGN/DEVICES

Locations: Footscray Park.
Prerequisites:VEH6111 - DIGITAL CIRCUIT DESIGN
Description: Bipolar and CMOS structures. Logic design: Introduction to CMOS circuit design: Switch level analysis of NMOS and CMOS structures., CMOS logic gates using static and dynamic logic, Precharging techniques, latch up, pass transistor/transmission gate logic. PLA logic: static and dynamic design. Memory. Design of subsystems using sequential logic.
Credit Points:12
Class Contact: Four hours per week for one semester comprising two hours per week of lecture and two hours per week of tutorial/laboratory.
Required Reading: Weste, N. and Eshragian, K., 1993, Principles of CMOS VLSI Design, Addison Wesley.
Assessment: Test, assignments and laboratory exercises 40%, final examination 60%.

VEH6122 CUSTOM IC DESIGN A

Locations: Footscray Park.
Prerequisites:VEH6121 - BASIC IC DESIGN/DEVICES
Description:CMOS cell design: device-level design constraints, Circuit optimisation techniques, gate matrix method. Review of tools for low-level cell design: Mentor Graphics circuit design and verification tools, HSPICE and PSPICE simulation tools. Basic analog building blocks. Timing issues in VLSI circuit design. Design of VLSI system sub-systems: Arithmetic and logic processing elements, adders, counters, etc, data path design and layout. Chip floorplanning.
Credit Points:12
Class Contact: Four hours per week for one semester comprising one hour per week of lecture and three hours per week of research project.
Required Reading: Gopalan, K., 1996, Introduction to Digital Microelectronic Circuits, IRWIN.
Assessment: Assignments, 40%; project, 60%.

VEH6142 EMERGING TECHNOLOGIES

Locations: Footscray Park.

Prerequisites: Nil.
Description: Yield of integrated circuits: Random distribution of defects, continuous and discrete distributions of defect density. Reliability: Failure rate, MTBF, accelerated testing. Fault tolerance: Static and dynamic redundancy. Processing and qualification of high reliability circuits, Group III-IV ICs and optoelectronics. GaAs IC design techniques. Advanced silicon VLSI technology. Advanced processing methods: Deep UV lithography, direct E-beam writing, X-ray lithography, Ion beam writing, silicon MBE, advanced etching techniques.
Credit Points:12
Class Contact: Four hours per week for one semester comprising of one hour per week of lecture and three hours per week of research project.
Required Reading: Selected papers from IEEE/IEE Journals. To be advised by the lecturer.
Assessment: Assignments, 40%; final project, 60%.

VEH6152 MICROPROCESSOR DESIGN TECHNIQUES

Locations: Footscray Park.
Prerequisites:VEH6111 Digital Circuit Design
Description:68020 programming model, data organisation, addressing modes and instructions sets. Exception processing, stack frames, parameter passing and procedure calls. Software development for embedded systems. External bus behaviour and design of decoders, Stack and BERR circuitry using PLDs. Interfacing memory and peripheral devices. Embedded microcontroller devices - architecture, features, peripherals and programming. Coprocessor interface and memory management.
Credit Points:12
Class Contact: Four hours per week for one semester comprising two hours per week of lecture and two hours per week of tutorial/laboratory.
Required Reading: Selected papers from IEEE/IEE Journals. To be advised by the lecturer.
Assessment: Test, assignments and laboratory exercises 40%, final examination 60%.

VEM2012 ELECTRICAL ENGINEERING

Locations: Footscray Park.
Prerequisites:REP1002 - ENGINEERING PHYSICS 1B
Description: Fundamentals of electrical circuit theory, DC circuits, Series/parallel circuits, Introduction to AC circuits. Basic operation, performance characteristics and selection of motors and generators. Introduction to electronics. Digital value representation, number systems, binary arithmetic operations. Boolean algebra, Boolean expression of digital circuits, Karnaugh Map simplification, combinational digital circuit design, Nand/Nor design. Circuit design using MSI components, decoders and multiplexers. Latches, flip-flops and concepts and sequential digital circuits. Binary counter and other modulus counter design. Typical circuits for analog to digital and digital to analog conversion. Devices for microprocessor interface.
Credit Points:12
Learning Outcomes: On successful completion of this unit students are expected to be able to: 1. Apply skills to solve DC and AC circuits for required electrical quantity; 2. Identify electrical motors and generators and be able to select a motor for a particular application; 3. Design and test combinational and sequential digital circuits including binary counters.
Class Contact:60 hours of lectures, tutorials and laboratory work.
Required Reading: Rizzoni, G (2000). Principles and applications of electrical engineering. McGraw Hill. Tocci, R.J. & Widmer, W.D. (1998). (6th ed.). DigitalSystems - principles and application Prentice-Hall.
Assessment: Laboratory Work, Laboratory Report 1, 5%. Laboratory Work, Laboratory Report 2, 5%. Laboratory Work, Laboratory Report 2, 5%. Assignment, Computer based, 10%. Test, Mid-semester test, 10%. Presentation, Tutorial presentation, 5%. Examination, Three hour examination, 60%.

VEM3001 CUSTOM IC DESIGN & EDA TOOLS

Locations: Footscray.
Prerequisites:VEF2004 Systems and Applications 2D
Description: The design of basic CMOS integrated circuits is covered, including overview of MOS technology, complex complementary CMOS design, combinational design techniques including dynamic and domino logic, CMOS Latchup and circuit protection. Students will develop hands-on experience in design, simulation, verification and implementation using industry standard EDA tools for custom design. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Gained knowledge of basic custom integrated circuits design
- Gained knowledge of custom integrated circuit design flow and circuit design
- Carried out significant tasks designed to improve desired generic skills and attributes.
- Gained knowledge of industry standard electronic design automation tools.
- Gained knowledge of electronic design automation tools for custom IC designs.

Class Contact:2.5 hours per week consisting of lectures/tutorials and laboratory.
Required Reading: Rabaey, J. M., 2002, Digital Integrated Circuits, 2nd Edition, Prentice Hall. Chang, H., Cooke, L., Hunt, M., Martin, G., McNelly, A. and Todd, L, 1999, Surviving the SOC Revolution . A Guide to Platform-Based Design , Kluwer Academic.
Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination 50%, a project 35% and satisfactory performance of laboratory based exercises 15%.

VEM3002 APPLICATION SPECIFIC IC DESIGN

Locations: Footscray.
Prerequisites:VEF2004 - SYSTEMS & APPLICATIONS 2D
Description: The design of Application Specific integrated circuits (ASIC) is covered, including introduction, ASIC VLSI design cycle, fundamental approach and design aspects, full and semi-custom design methodology, IBM ASIC design flow place and route, ESD failure, and ESD protection. Students will also develop hands-on experience in design, simulation, verification and implementation using industry standard EDA tools for ASIC design. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory

exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Gained knowledge of Application Specific Integrated Circuits design.
- Gained knowledge of ASIC integrated circuit design flow and circuit design.
- Carried out significant tasks designed to improve desired generic skills and attributes.

Class Contact:2.5 hours per week consisting of lectures/tutorials and laboratory exercises.
Required Reading: Chinnery, D., Keutzer, K., Keutzer, K. W., Closing the Gap Between Asic & Custom: Tools and Techniques for High-Performance Asic Design , Kluwer Academic Publishers, 2002.
Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination 50%, a project 35% and satisfactory performance of laboratory based components of this unit 15%

VEM4001 ADVANCED CUSTOM IC DESIGN

Locations: Footscray Park.
Prerequisites: Nil.
Description: Overview of MOS and sub-micron technology, scaling and signal integrity, IC design techniques. CMOS cell design: device-level design constraints, gate design, pas transistor circuits, sequential circuits, mask level design. Layout considerations, design rules and mask level design. Circuit optimisation techniques. Timing issues in VLSI circuit design. Design of VLSI system sub-systems: Arithmetic and logic processing elements, adders, counters, I/Os, buffers, data path design and layout, etc. Chip floor planning. Design tradeoffs-cost, power and performance. The syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit of study will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Gained knowledge of basic integrated circuits design.
- Gained knowledge of integrated circuit design flow and circuit design.
- Carried out significant tasks designed to improve desired generic skills and attributes.

Class Contact:2.5 hours per week consisting of lectures/tutorials and laboratory exercises.
Required Reading: Rabaey, J. M., 2002, Digital Integrated Circuits, 2nd Edition, Prentice Hall.
Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination 50%, a project 35% and satisfactory performance of laboratory based components of this unit 15%.

VEM4002 HETEROGENEOUS SYSTEMS

Locations: Footscray Park.
Prerequisites:VEM3002 - APPLICATION SPECIFIC IC DESIGN
Description: Overview of current trends in semiconductor technology, fundamental physical and economic constrains, technology roadmap for semiconductors, challenges and needs for nano-electronics, organic and molecular microelectronics, system implementation issues, development of mixed signal and RF systems, MEMS, wireless sensor networks, ambient technology. The syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit of study will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Gained knowledge of current trends in semiconductor technology.
- Gained knowledge of simulation and design of heterogeneous systems.
- Carried out significant tasks designed to improve desired generic skills and attributes.

Class Contact:2.5 hours per week consisting of lectures/tutorials and laboratory exercises.
Required Reading: Luryi, et al., Future Trends in Microelectronics, 2004.
Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination 50%, a project 35% and satisfactory performance of laboratory based components of this unit 15%.

VEM4012 DESIGN FOR TESTABILITY

Locations: Footscray Park.
Prerequisites:VEH3001 - DIGITAL SYSTEM DESIGN A
Description: Techniques to improve the testability of microelectronics circuits and systems are covered. Design for test concepts, ad-hoc and structured, which improve the circuit to allow efficient testing after manufacturing are fully analysed. This includes device reliability, memory reliability, test issues, controllability and observability, built in self test, scan chain synthesis, boundary scan, automatic test pattern generation, and system on chip test issues. Students will develop hands-on experience in design for test using industry standard EDA tools. The unit of study is designed to provide support for students requiring knowledge of electronic circuits design in a concurrently studied Engineering Design unit. The specific aims of this unit of study are to help students develop competence in and comprehension of the principles of reliability and design for test of microelectronics circuits and systems, learn the fundamentals of various ad-hoc and structures design for test techniques for digital microelectronic circuits and to develop practical skills with industry standard tools, methods and techniques through practical application. The unit will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit of study will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Gained an appreciation of reliability issues related to microelectronic devices and integrated circuits.
- Gained an understanding of circuit testability issues and design for testability.
- Gained knowledge in fault modelling and testing methodologies.
- Gained an appreciation for system level testing.
- Developed skills in the use of EDA design for test tools.

Class Contact: 2.5 hours per week consisting of lectures/tutorials and laboratory exercises.
Required Reading: Lala, P.K., Digital Circuit Testing and Testability, Academic Press, 1997.
Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination 60%, satisfactory performance of laboratory based exercises and project work 40%.

VEM4100 ANALOG AND MIXED SIGNAL DESIGN

Locations: Footscray Park.
Prerequisites: VEF2004 - SYSTEMS & APPLICATIONS 2DVEM3001 - CUSTOM IC DESIGN & EDA TOOLS
Description: The design of CMOS analog and mixed-signal integrated circuits is covered. Design concepts of high speed low power amplifiers, filters, sample and hold circuits, comparators, digital to analog and analog to digital converters are fully analysed. Students will develop hands-on experience in design, simulation, verification and implementation using industry standard EDA tools.
Credit Points: 6

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to:

- have good understanding off most common integrated circuit design, and D/A and D/A converters.
- Hands-on experience using industry standard Software design tools.

Class Contact: 2.5 hours per week consisting of lectures/tutorials and laboratory exercises.
Required Reading: Behzad Razavi, 'Design of analog CMOS integrated circuits', McGraw hill International Edition, 2001.
Assessment: Laboratory exercises: 20%; Project: 20%; Final Examination: 60%.

VEP3000 PHOTONICS A

Locations: Footscray Park.
Prerequisites: VEF1002 - ENABLING SCIENCES 1BOR ENF1202 Engineering Physics 2
Description: Lens systems: thick lens design using matrix methods. Aberrations: spherical aberration, coma, astigmatism, field curvature and distortion. Ray intercept plots. Methods for reducing aberrations. Optical fibres: Overview of optical fibres and their properties. Attenuation in silica optical fibres. Modes in slab waveguides and optical fibres. Dispersion and distortion in optical fibres. Light sources and detectors for optical fibre systems. Noise in detector systems. Fibre optic communication system design. Optical amplifiers, WDM systems, Bragg gratings. Fibre optic sensors. Optical fibre fabrication. Emerging trends.
Credit Points: 12
Class Contact: 60 hours per semester comprising 48 hours of lectures/tutorial and 12 hours of laboratory.
Required Reading: Hecht, E., 2002, Optics, 4th edn, Addison Wesley, USA; Palais, J.C. 2005, Fibre Optic Communications, 5th edn, Prentice-Hall: N.J.
Assessment: Assignments conducted throughout the semester 20%; Laboratory performance 20%; End of semester examination 60%.

VEP3001 PHOTONICS

Locations: Footscray Park.
Prerequisites: VEF1002 - ENABLING SCIENCES 1B
Description: This unit provides an introduction to photonics and optoelectronics, and also support for students requiring knowledge of the creation, transmission and detection and manipulation of light (photons) in a concurrently studied PBL unit. In this unit students will be presented with a description of the nature of light, the generation of light (light sources and their properties such as lasers, light emitting diodes), the transmission of light (optical fibres and waveguides, optical amplifiers), the detection. The primary delivery means of the syllabus will be by lecture, supported by laboratory demonstrations.
Credit Points: 6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent PBL exercises. On successful completion of this unit, students are expected to be able to:

- To have a basic understanding of the properties of light and behaviour as light particles (photons).
- To understand the properties of lasers and optical amplification
- To understand the properties of semiconductor photonics.
- To understand properties of optical fibres and waveguides and how they transmit light.
- To understand how optical fibre systems are designed.

Class Contact: 30 hours of class contact per semester. 2 hours of lecture/tutorial and 0.5 hours of laboratory exercises per week.
Required Reading: Palais, J.C., Fibre Optic Communications, 5th edn, 2004, Prentice Hall: N.J.
Assessment: End of semester examination 65%, two assignments 15% and requires satisfactory performance of laboratory based components of this subject 20

VEP3002 PHOTONICS 2

Locations: Footscray Park.
Prerequisites: VEF1001 - ENABLING SCIENCES 1AVEF1002 - ENABLING SCIENCES 1B
Description: In this unit students will be presented with a wave description of light starting with Maxwell s equations Maxwell's equations for waveguides, boundary conditions and eigenvalue equations, planar dielectric waveguides and their modes, step index optical fibres, graded index optical fibres. Optical fibre sensors: Introduction and basic concepts, materials interactions in optical fibre sensors, polarisation, Jones' vectors and matrices, interferometers, fibre Bragg gratings. The syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent PBL exercises. In addition to delivery by lecture, the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points: 6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent PBL exercises. Upon successful completion of this unit of study, the students are expected:

- To understand the wave nature of light and its interactions with optical materials.
- To understand the waveguiding properties of slab waveguides and optical fibres.
- To understand how photonics is used in sensing.

Class Contact:30 hours of class contact per semester. 2 hours of Lecture/Tutorial and 0.5 hours of laboratory exercises per week

Required Reading: Buck, J.A., Fundamentals of Optical Fibres, 1995, John Wiley & Sons, New York.

Assessment: Students will be assessed in this unit of study on the basis of an end of semester examination(65%), two assignments(15%) and satisfactory performance of laboratory based exercises(20%). Evaluation of CGA in unit(as %): Level 1(%) Level 2(%) Level 3(%) Problem Solving 10 20 20 Using Information 10 20 20 Communication Oral 0 0 0 Communication Written 0 0 0 Professional - Autonomous 0 0 0 Professional - Collaborative 0 0 0 Social & Cultural Diversity 0 0 0

VEP4000 PHOTONICS B

Locations: Footscray Park.

Prerequisites:VEP3001 - PHOTONICSVEP3002 - PHOTONICS 2

Description: Lasers: Interaction of radiation with matter; absorption, spontaneous emission and stimulated emission. Population inversion, net gain. Introductory ideas of optical cavities, threshold. Time behaviour of laser output, burst-mode and Q-switched pulses. General requirements for CW output. Rate equations. Overview of laser materials and pumping methods. Examples of lasers. Short pulse and tunable laser techniques. Laser applications. Laser safety and laser hazards.Optical fibre waveguides and related devices: rigorous treatment of Maxwell's Equations for waveguides, boundary conditions and eigenvalue equations, planar dielectric waveguides and their modes, cylindrical dielectric waveguides and their modes, LP mode description, Gaussian approximation, dispersion in multimode and single mode fibres, normal mode theory of single mode fibre couplers. Design and operation of communication systems including those using dense wavelength division multiplexing.Optical Fibre Sensors: Introduction and basic concepts, materials interactions in optical fibre sensors, fibre optic components, special optical fibres for sensors, interferometric sensors, fibre-optic gyroscope, intensity and wavelength-based sensors, multiplexed and distributed sensors, applications of fibre sensors, e.g. smart structures.

Credit Points:12

Class Contact:60 hours per semester comprising 48 hours of lectures/tutorial and 12 hours of laboratory.

Required Reading: Verdeyen, J.T. 1995, Laser Electronics, 3rd edn, Prentice-Hall International, USA; Buck, J. A., 1995, Fundamentals of Optical Fibres, John Wiley & Sons, New York.

Assessment: Assignments conducted throughout the semester 20%; Laboratory performance 20%; End of semester examination 60%.

VES1001 INTRODUCTION TO SPORTS ENGINEERING

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit is based on a series of challenges designed to introduce students to systematic problem solving methods and to explore various aspects of sports engineering. The problems and challenges will be designed to address fundamental issues related to sports engineering including exposure to human motion detection & recording, human performance assessment, equipment and facilities design and sports related instrumentation and measurement. The unit is designed to encourage students to discover and investigate various facets of sports engineering. The unit will also include an introduction to oral and written communications.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply fundamental knowledge of mathematics and science to systematically solving sports engineering problems; 2. Find, organise and apply information related to engineering problems; 3. Communicate effectively with others orally and in writing; 4. Work individually and collaboratively, as both a team member and leader, to complete tasks and evaluate own and others' performance using prescribed methods; 5. Demonstrate awareness of social and cultural perspectives that impact on learning and working in a team; 6. Evaluate the effectiveness of their solutions.

Class Contact: Sixty (60) hours for one semester comprising workshops, lectures, laboratory activities and field experiments.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Report, Three team reports (2000 words equivalent each), 40%. Presentation, Individual oral presentation, 20%. Portfolio, Individual portfolio, 40%.

VES2102 OPERATING SYSTEMS AND TOOLS

Locations: Footscray Park.

Prerequisites:VEF1004 - ELECTRICAL FUNDAMENTALS 1B

Description: Operating System Basics: Kernel, Processes, Device Drivers, Shells: Commands and Arguments, Shell Scripts, File Systems: Directory structure, File Attributes, Permissions, Ownerships. System Security and Integrity:Backup and Restore. Access Controls. System Installation and Configurations. PERL and applications.

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- write shell scipts to automate routine system management task;
- use PERL to perform more complex system routines;
- describe clearly the components and functions of a modern day OS;
- perform routine operating system management task.

Class Contact:30 hours of contact comprising 20 hours of lectures/tutorials and 10 hours of laboratory sessions.

Required Reading: Ng, Y. (Ed.). (2008). Class notes (Rev. ed.). Footscray, Australia: Victoria University, School of Electrical Engineering.

Assessment: Laboratory Assignments (30%); Tests (10%); Examination (60%).

VES2201 DESIGN & ERGONOMICS

Locations: Footscray Park.

Prerequisites:ENF1204 - INTRODUCTION TO ENGINEERING DESIGNVAM2121 - MECHANICS OF ENGINEERING MATERIALS

Description: This unit is based on engineering projects (one minor and one major) to introduce students to the design of sporting apparatus and associated structures. It revolves around the production of project design calculations and reports The theoretical aspects are based on load - capacity relationships of mechanical elements which are brought out in the following design principles: Design uncertainties and reliability, theories of static failure, low and high cycle fatigue failure, linear and torsional impact failure, deflection failure, anthropometry, human factors and ergonomic design. Use of relevant design software such as computer-aided design and solid modelling will be introduced.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Demonstrate an understanding of the concepts for static and dynamic actions; 2. Apply concepts in the determination of design loads to an introductory level; 3. Show ability within the context of the subject areas, to formulate and solve basic design problems; 4. Critically evaluate the sensibility of design outcomes; 5. Show a basic understanding of ergonomic design; 6. Present design outcomes both written and orally in a professional manner; 7. Demonstrate the ability to work both autonomously and as a member of a design team; 8. Demonstrate knowledge of how professional design engineers work.

Class Contact: Sixty (60) hours for one semester comprising team workshops, including supporting lectures and labs.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Test, Skills audits (three at 30 mins each), 30%. Report, One major design team report (7000 words equivalent), 50%. Presentation, Oral presentation, 20%.

VES3101 INTRODUCTION TO COMPUTER NETWORKS A

Locations: Footscray Park.

Prerequisites:VEF2003 - SYSTEMS AND APPLICATIONS 2CVEF2004 - SYSTEMS & APPLICATIONS 2D

Description: This unit of study is designed to provide students with a good understanding of the hardware and techniques that underpin a modern computer network. The unit will also provide support for Engineering Design unit that has a computer network focus.This unit will cover: Basic concepts of computer communication. Data and signals, Frequency Spectrum and bandwidth, Data encoding, Framing and synchronisation. Modulation of data, Modems. Physical layer interfaces. Transmission of data, Transmission media, Multiplexing. Error detection and correction. Data link control, Data link protocols. Local area networks. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent PBL exercises. In addition to delivery by lecture and tutorial, the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- Have a good understanding of the basic principles and techniques used in computer data communication.
- Have a good foundation for further learning in Computer networking

Class Contact:30 hours of class contact. 2 hours of Lecture/Tutorial and 0.5 hours of Laboratory exercises per week.

Required Reading: Forouzan. B., Fagan. S. C., Data Communication and Networking, McGraw Hill, 2006.

Assessment: Written Examination (40%): Class Tests (30%): (Two 1 hour tests to be held during the semester teaching period.) Laboratory Assignments (30%): (Five laboratory assignments, each 6%). Evaluation of CGA in unit(as %): Level1(%) Level2(%) Level3(%)

VES3102 INTRODUCTION TO COMPUTER NETWORKS B

Locations: Footscray Park.

Prerequisites:VEF2002 - SYSTEMS AND MATHEMATICS 2BVEF2004 - SYSTEMS & APPLICATIONS 2D

Description: This unit of study is designed to provide students with a good understanding of computer networking protocols and the management of computer networks. The unit will also provide support for Engineering Design unit that has a computer network focus. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. This unit will cover: Network Models: OSI, TCP/IP; Network Layer - IP addressing, subnetting, netmask, IP protocols, ARP, ICMP, IP routing; Transport Layer - TCP, UDP protocols, flow control, error control, BSD sockets; Application Layer: DNS, HTTP. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students will be able:

- To have a good understanding of principle and practice of computer networking protocols.
- To design and manage a computer network.

Class Contact:30 hours of class contact. 2 hours of Lecture/Tutorial and 0.5 hours of Laboratory exercises per week.

Required Reading: Tanenbaum, A., Computer Networks., 4th Ed, Prentice Hall, 2003.

Assessment: Written Examination 40%, Class Tests 20%, Laboratory Assignments 40% (Five laboratory assignments, each 8% weighting).

VES3104 NETWORK SOFTWARE AND INTERNET PROGRAMMING

Locations: Footscray Park.

Prerequisites:VES2102 - OPERATING SYSTEMS AND TOOLSVES3102 - INTRODUCTION TO COMPUTER NETWORKS B

Description: Network Software : Webserver, Webproxy, Firewall, Remote Access Server, Webadmin, Internet Programming: HTML, Javascript and applications.

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- describe the operations and functionalities of webserver, webproxy, firewall and remote access server;
- install, configure and manage these network servers;
- implement interactive web pages using Javascript.

Class Contact:30 hours of contact comprising 15 hours of lectures/tutorials and 15 hours of laboratory sessions.

Required Reading: Ng, Y. (Ed.). (2008). Class notes (Rev. ed.). Footscray, Australia: Victoria University, School of Electrical Engineering.

Assessment: Laboratory Assignments (30%); Tests (10%); Examination (60%).

VES3111 MECHATRONICS & SENSORS 1

Locations: Footscray Park.

Prerequisites: ENE2202 - ELECTRONIC SYSTEMS

Description: This unit is designed to build upon the basic Sports Engineering sensor concepts learned in VES1001. Study sensors characteristics and performance. Selection of suitable sensors for human activities. More advanced problems and challenges will be set to facilitate and demonstrate the utility of sensors in real-world sports. Related measurement and control systems will be investigated. Students will be encouraged to experiment with and devise practical sensors, measurement and control systems.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Show an understanding of the merits and limitations of sensors and control systems; 2. Demonstrate knowledge of sources of the appropriate sensors and transducers; 3. Demonstrate the ability to read and understand sensor and transducer technical characteristics; 4. Apply their knowledge to the design of more advanced measurements systems.

Class Contact: Sixty (60) hours for one semester comprising lectures, workshops, laboratory activities and field experiments.

Required Reading: Bartlett, R 2007, 2nd edn, Introduction to sports biomechanics: analysing human movement patterns, Routledge.

Assessment: Test, Mid-semester test (1.5 hour), 20%. Portfolio, Individual portfolio presentation and team report (5000 words equivalent), 30%. Examination, Final (three hours), 50%.

VES3121 SPORTS MATERIALS

Locations: Footscray Park.

Prerequisites: VAM2121 - MECHANICS OF ENGINEERING MATERIALS

Description: This unit is designed to give students a sound knowledge of various types of materials for use in sports engineering applications. Students will study the fundamentals of materials science (atomic structure and bonding). Material classes and their characteristics metals, polymers ceramics and biomaterials (including timber and human tissue). Engineering properties of materials (strength, elasticity, plasticity, hardness, toughness, dynamic cushioning and damping and thermal and electrical properties). Material selection and performance. Introduction to composite materials and their application. Students will undertake a series of informative laboratory and field experiments to assist in their understanding of the properties and behaviour of various engineering materials commonly used in sporting applications.

Credit Points: 12

Learning Outcomes: Upon successfully completing the unit, students will be able to: 1. Demonstrate a sound understanding of various engineering material types and their application to sports; 2. Predict the behaviour of materials under various sport loads such as static loads, impacts and collisions, and climatic fluctuations; 3. Undertake effective and practical material selection for the design of sports materials that enhance the performance of athletes; 4. Identify and select suitable materials that afford protection against injury, while optimizing freedom of movement and comfort; 5. Demonstrate the ability to justify their decisions on material selection.

Class Contact: Sixty (60) hours for one semester comprising team workshops, including supporting lectures and labs.

Required Reading: Callister, W D Jr 2004, Materials science and engineering - an introduction, John Wiley and Sons Inc.

Assessment: Assignment, Team based assignments (three at 2000 words equivalent each), 30%. Portfolio, Individual portfolio, 30%. Examination, Final exam (three hours), 40%.

VES3131 COMPUTER AIDED ENGINEERING DESIGN

Locations: Footscray Park.

Prerequisites: VES2201 - DESIGN & ERGONOMICSVAM2121 - MECHANICS OF ENGINEERING MATERIALS

Description: This unit is based on three engineering projects that will each be based on a specific aspect of computer-aided mechanical design: 1. The modelling of solids. This will involve the generation of three-dimensional drawings using a suitable solids modelling software tools. The computer files will be used to compute various 3D properties of the design such as volume, centre of gravity, radius of gyration etc. This component will be based on the learning outcomes from VAM2201 Design and Ergonomics. 2. The estimation of stresses and deflections using finite element modelling and analysis. Students will analyse the engineering performance of their design using suitable Finite Element Analysis software tool. This will be supported by the fundamental theory of finite element analysis with respect to computing stresses and deflections. This component will be based on the learning outcomes from VAM2121 Mechanics of Engineering Materials. 3. Computer-aided kinematic and kinetic analysis of rigid-body systems and mechanisms using suitable software tools. Students will generate solutions for a variety of systems and mechanism. This component will be based on the learning outcomes from VAM3071 Dynamics.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Generate designs using modern computer-aided engineering tools; 2. Predict and evaluate the mechanical performance of their design using a range of computer-aided engineering tools to compute geometric characteristics, stress and deflection properties and kinetic and kinematic performance for rigid body systems; 3. Show the ability within the context of the subject areas, to formulate and solve basic design problems; 4. Critically evaluate the sensibility of design outcomes; 5. Present design outcomes both written and orally in a professional manner; 6. Demonstrate the ability to work both autonomously and as a member of a design team; 7. Demonstrate a sound knowledge of the role of computer-aided engineering design.

Class Contact: Sixty (60) hours for one semester comprising team workshops, including supporting lectures and labs.

Required Reading: Benny Raphael and Ian F C Smith 2003, Fundamentals of computer-aided engineering, Wiley.

Assessment: Portfolio, Design project 1 - Solid Modelling, 30%. Portfolio, Design project 2 - Finite element analysis, 30%. Portfolio, Design project 3 - Kinematic / kinetic analysis, 30%. Presentation, Oral presentation, 10%.

VES3141 SPORTS DYNAMICS

Locations: Footscray Park.

Prerequisites: ENF1201 - ENGINEERING MATHEMATICS 2ENF1202 - ENGINEERING PHYSICS 2

Description: This unit of study aims to give students an understanding of principles of engineering dynamics including particle dynamics and rigid body dynamics (kinematics and kinetics) in two and three dimensional space, as well as to develop problem solving, computing and design skills in the areas of mechanism design and analysis. It covers the following topics. Introduction to dynamics, Kinematics of particles - rectilinear and plane curvilinear motion co-ordinates systems, 3-D curvilinear motion and relative motion. Plane kinematics of rigid bodies - rectilinear and plane curvilinear motion, relative velocity, instantaneous centre of zero velocity, relative acceleration, space curvilinear motion. Kinetics of particles - Newton's law, work and energy, impulse and momentum. Plane kinetics of rigid bodies - moments and products of inertia, Newton's law, work and energy, impulse and momentum. Three-dimensional dynamics of rigid bodies - kinematics, kinetics, gyroscopic motion.

Credit Points:12

Learning Outcomes: Upon successful completion of this unit, students will have: 1. Developed an understanding of processes and key issues related to particle dynamics and rigid body dynamics in two and three-dimensional space; 2. Demonstrated an ability to solve a wide range of problems and carry out design tasks using kinematics of particles, plane kinematics of rigid bodies, kinetics of particles, plane kinetics of rigid bodies and three-dimensional kinematics and kinetics of rigid bodies; 3. Completed work designed to improve a number of generic skills including problem identification / formulation / solution, effective oral and written communication, experimental techniques, computer skills and the ability to use a systematic approach to design, and a capacity to undertake life-long learning.

Class Contact: Sixty (60) hours per semester comprising lectures, tutorials and workshops.

Required Reading: Meriam J.L. and Kraige L.G (2002) 5 Engineering Mechanics Vol. 2 DYNAMICS John Wiley and Sons Riley W.F. and Sturges L.D. (1996) 2 Engineering Mechanics, DYNAMICS John Wiley and Sons

Assessment: Assignment, Three assignments (1000 words equivalent each), 20%. Examination, Final exam (three hours), 50%. Report, Report (4000 words equivalent), 30%.

VES3202 MECHATRONICS & SENSORS 2

Locations: Footscray Park.

Prerequisites:VES3111 - MECHATRONICS & SENSORS 1

Description: This unit is designed to expand and build upon the knowledge gained in VES3111. Students will be studying sensors used in human motion monitoring and human bio-sensing. The design aspect of the unit will be based on specific projects allocated as group work. The students will be working on allocated project, designed to enhance their knowledge of more advanced sensing and control systems in sport engineering applications. The students will be required to research and apply sensor applications for the assigned projects and use state of the art technology.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Research the state of the art in sensor technology; 2. Show an understanding of and select sensors suitable for human motion monitoring and human bio-sensing; 3. Show an understanding of and form a technical design brief from a general lay description of the project; 4. Complete a performance appraisal of the project outcome; 5. Demonstrate the ability to work collaboratively with colleagues and produce tangible results.

Class Contact: Sixty (60) hours for one semester comprising lectures, workshops, laboratory and fieldwork.

Required Reading: Reading material will be negotiated in consultation with the supervisor and will be appropriate to the topic under investigation.

Assessment: Test, Mid-semester test (1.5 hours), 20%. Portfolio, Individual portfolio presentation and team report (5000 words equivalent), 40%. Examination, Final exam (three hours), 40%.

VES3212 SPORTS ENGINEERING PROJECT

Locations: Footscray Park.

Prerequisites:VES3131 - COMPUTER AIDED ENGINEERING DESIGN

Description: This unit is designed to consolidate engineering research, investigation or design experience by requiring each student to undertake an individual engineering project, selected from a list of projects offered or proposed by the student and approved by an academic. Projects are sourced from industry and academia. Each student is supervised by a staff member with expertise in the area of the project. Oral presentation skill, and report writing are further developed from the previous years. The project must include a strong engineering theme relevant to sports engineering which may cover the broad spectrum of the topics studied in this course. Industry projects must be assessed by the subject coordinator and have an academic and industry supervisor.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Conduct research on a specific project topic using all available resources including books, internet journals, etc.; 2. Solve problems in a scientific manner and select the necessary components; 3. Plan and manage a project using project management facilities such as Microsoft project manager.

Class Contact: Sixty (60) hours for one semester comprising student projects. Students will undertake projects while managing their own time under academic supervision.

Required Reading: Mukhopadhyay, 2008, Smart sensors and sensing technology, Springer. Barlett, 2007, Introduction to sports biomechanics/analyzing human movement patterns 2, Routledge. Webster, 1999, The measurement, instrumentation and sensors handbook, Boca Raton, CRC Press.

Assessment: Presentation, Progress presentation, 20%. Report, Final report (15,000 words equivalent), 50%. Project, Evaluation (judged) quality of project product or outcome, 30%.

VES3232 SPORTS ENGINEERING MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: Role and responsibilities of engineering managers in the industry. Principles of engineering management. General management principles and engineers as managers. Introduction to network planning, critical path analysis, resource allocation and the management of a development project. Feasibility studies and project evaluation. Economic analysis of engineering projects. Financial modelling of engineering systems. Strategies for plant selection. Planning and scheduling techniques for engineering projects. Tools for project control. Planning techniques for repetitive construction or production. Optimising resources and trend monitoring. Management of the development process using a computer package.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Prepare a plan, prepare network logic diagrams, determine critical paths and optimise project resources; 2. Apply the time value of money concepts for the economic evaluation of engineering systems or projects; 3. Apply general management principles for the successful delivery and management of engineering projects; 4. Use commercially available software, such as Microsoft Project and Microsoft Excel, as time management and economic analysis tools.

Class Contact: Sixty (60) hours for one semester comprising lectures, tutorials and computer laboratories.

Required Reading: Leland Blank & Anthony Tarquin, 2007 Engineering Economy Antill J.M., 1999 3rd ed. Antill's Engineering Management Wiley Rory Burke, 2005 Project Management: Planning and Control Techniques

Assessment: Test, Class tests (three at 30 mins each), 20%. Report, Major report (15,000 words equivalent), 60%. Assignment, two at 1500 words equivalent each, 20%.

VES4101 COMPUTER SYSTEMS A

Locations: Footscray Park.

Prerequisites:VEF2003 - SYSTEMS AND APPLICATIONS 2CVEF2004 - SYSTEMS & APPLICATIONS 2D

Description: This unit is designed to provide students with a good understanding of Operating Systems principles and the practical abilities to interact with modern OSs, both at the user's and programmer's levels. The unit will also provide support for Engineering Design unit that has a computer/OS focus. This unit will cover: Process: thread, process synchronisation, semaphore, thread library, consumer-producer problem, dead locks, resource allocation, scheduling. Files systems : directory structures, access control, implementation. Memory Management : memory allocation, protection, virtual memory. Grid : principles and applications. The syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- have a basic understanding of the structure and operations of a modern computer system.
- be able to access operating system facilities and resources by using a high level language such as C.
- be able to develop multithreaded applications for a modern OS such as Unix
- have a basic understanding of principle of GRID computing environment.

Class Contact:30 hours of class contact. 2 hours of Lecture/Tutorial and 0.5 hours of Laboratory exercises per week.

Required Reading: Silberschatz. A., Operating Concepts, 7th Edition, Wiley, 2005.

Assessment: Written Examination 40%, Class Tests 20%, Laboratory Assignments (Five laboratory assignments, each 8% weighting) 40%.

VES4102 COMPUTER SYSTEMS B

Locations: Footscray Park.

Prerequisites:VEF2003 - SYSTEMS AND APPLICATIONS 2CVEF2004 - SYSTEMS & APPLICATIONS 2D

Description: This unit of study is designed to provide students with a good understanding of graphical user interfaces design and implementation in application programming. The unit will also provide support for Engineering Design unit that has a programming user interface need. This unit will cover: Introduction to graphical user interfaces (GUI). Application of object oriented techniques to the production of windows-based programs. Window interface design, placement, and implementation. Development of class libraries. Platform independent window toolkit. The syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to:

- have a good understanding of principle and application of object oriented paradigm to user interface design.
- be able use window GUI class libraries to implement user interfaces in application programs.

Class Contact:30 hours of class contact. 2 hours of Lecture/Tutorial and 0.5 hours of laboratory exercises per week.

Required Reading: Deitel.H, Java How to Program, 7/e, Prentice Hall, 2007.

Assessment: End of semester examination 40% Class Tests 20% Laboratory Assignments (Five laboratory assignments, each 8% weighting):40

VES4301 SOFTWARE ENGINEERING

Locations: Footscray Park.

Prerequisites:VEF2003 - SYSTEMS AND APPLICATIONS 2CVEF2004 - SYSTEMS & APPLICATIONS 2D

Description: The unit's aim is to introduce students to the principle, technique and practice of the current software engineering process. The unit will also provide support for Engineering Design unit that has software engineering focus. This subject will cover: Introduction to the engineering of quality software. The software development lifecycle model. System analysis, software requirements definition, specification, elicitation, analysis and modelling. Process specifications and data dictionary production. Software design process, principles and production. The testing process, planning and strategies. CASE tools and software engineering environments. Software project planning and estimating. The syllabus will be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises.

Credit Points:6

Learning Outcomes: The Learning outcomes of this unit of study will depend upon the lectures presented, as required to support concurrent Engineering Design exercises. On successful completion of this unit, students are expected to be able to apply best practice software engineering process to the specification, design, construction, delivery and maintenance of software.

Class Contact:30 hours of class contact per semester. 2 hours of Lecture/Tutorial and 0.5 hours of Laboratory exercises per week.

Required Reading: Schach. S, Classical and Object-Oriented Software Engineering, 7/e, McGraw Hill, 2006.

Assessment: End of semester examination :40% Class Tests :20% Laboratory Assignments (Five laboratory assignments, each 8%):40%

VET3100 ANALOG AND DIGITAL COMMUNICATIONS

Locations: Footscray Park.

Prerequisites:VEF2002 - SYSTEMS AND MATHEMATICS 2B

Description: This unit of study provides an introduction to Telecommunication Engineering. The unit is designed to provide the theoretical basis for the understanding of the engineering aspects of the design, construction, and operation of the existing and emerging Telecommunication systems. It also provides the support for students requiring basic knowledge of Telecommunication Engineering in order to handle concurrently studied Engineering Design projects that involve various aspects of Telecommunication Engineering. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent PBL exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.

Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Explain signals and their characteristics as depicted in time and frequency domains;
- Discuss the information bearing nature of signals and the bandwidth considerations;
- Explain the principles behind frequency translation and its depiction as various types of modulation;
- Explain the signal transition in linear and non-linear systems, and the recognition of such systems in terms of filters and other components;
- Describe the types of noise present in telecommunication systems and the characterization of thermal noise;
- Perform the statistical analysis of random signals and the characterization of such signals in terms of correlation and power spectral density functions;
- Explain the concept of signal to noise ratio and its influence in faithful reception of analog and digital signals;
- Outline the assessment of performance in digital communication systems in terms of bit error probability;
- Explain the basis of line coding and application of line coding in baseband digital communication systems;
- Discuss the baseband recovery of bandpass communication systems and the impact of the type of modulation in such systems.

The Learning Outcomes of this unit of study will also depend upon the material presented, as required to support the concurrent Engineering Design exercises.

Class Contact:30 hours of class contact for one semester comprising 2 hours of lecture/tutorials and 0.5 hours of laboratory work per week.
Required Reading: Lathi, B. P. (2001). Modern digital and analog communication systems (3rd ed.). Oxford University Press.
Assessment: Continuous assessment in laboratory work (6 hours per semester) (20%); mid-semester written test (20%); end-of-semester examination (60%).

VET3200 DIGITAL MODULATION AND CODING

Locations: Footscray Park.
Prerequisites:VET3100 - ANALOG AND DIGITAL COMMUNICATIONS
Description: This unit of study provides continuation of the Communication Systems Engineering stream covering the remaining areas of the main stream Telecommunication Engineering. The unit is designed to provide the theoretical basis for the understanding of the engineering aspects of the design, construction, and operation of the existing and emerging Telecommunication systems. It also provides the support for students requiring basic knowledge of Telecommunication Engineering in order to handle concurrently studied Engineering Design projects that involve various aspects of Telecommunication Engineering. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent PBL exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Explain the principles of digital communication systems and components;
- Describe the optimum signal detection using matched filter receiver in additive white Gaussian noise;
- Explain the baseband transmission techniques;
- Discuss the effects of bandwidth limitation, intersymbol interference, Nyquist signalling and channel equalization;
- Describe the bandpass transmission techniques;
- Describe the BPSK, QPSK, and QAM modulation systems and coherent detection of those systems;
- Explain the carrier and clock synchronization techniques;
- Explain the channel coding including linear block codes, convolutional codes, Viterbi decoding;
- Explain information theory, source coding, and data compression;
- Explain coded modulation systems, trellis coding, and decoding;

The Learning Outcomes of this unit of study will also depend upon the material presented, as required to support the concurrent Engineering Design exercises.

Class Contact:30 hours of class contact for one semester comprising 2 hours of lecture/tutorials and 0.5 hours of laboratory work per week.
Required Reading: Kurzweil, J. (2000). An introduction to digital communications. John Wiley. Proakis, J. G., & Salehi, M. (2002). Contemporary communication systems using MATLAB. Belmont, CA: Thomson Brooks/Cole.
Assessment: Continuous assessment in laboratory work (6 hours per semester) (20%); mid-semester written test (20%); end-of-semester examination (60%).

VET4101 FIELD AND WAVES IN TELECOMMUNICATIONS

Locations: Footscray Park.
Prerequisites:VEF2002 - SYSTEMS AND MATHEMATICS 2B
Description: This unit of study provides an introduction to Field and Wave in Telecommunication Engineering. The unit is designed to provide the theoretical basis for the understanding of the engineering aspects of the design, construction, and operation of the existing and emerging Telecommunication systems. It also provides the support for students requiring basic knowledge of Telecommunication Engineering in order to handle concurrently studied Engineering Design projects that involve various aspects of Telecommunication Engineering. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial, the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Describe the space and material media that are capable of carrying signals used in Telecommunication systems;
- Describe the physical composition of such media, their characteristics and modes of operation;
- Discuss the limitations of such media with regard to frequency, bandwidth, and power;
- Explain the phenomena of propagation of electromagnetic waves in space and material media including coaxial cables and waveguides;
- Discuss the theoretical basis for electromagnetic wave propagation including the derivation and application of Maxwell s equations;

- Explain the Smith chart and its application in the design of high frequency circuits and systems;
- Explain free space propagation and practical propagation models.

The Learning Outcomes of this unit of study will also depend upon the material presented, as required to support the concurrent Engineering Design exercises.

Class Contact:30 hours of class contact for one semester comprising 2 hours of lecture/tutorials and 0.5 hours of laboratory work per week.
Required Reading: Cheng, D. K. (1999). Field and wave electromagnetics (2nd ed.). Addison Wesley.
Assessment: Continuous assessment in laboratory work (6 hours per semester) (20%); mid-semester written test (20%); end-of-semester examination (60%).

VET4202 DATA COMMUNICATIONS

Locations: Footscray Park.
Prerequisites:VET3100 - ANALOG AND DIGITAL COMMUNICATIONS
Description: This unit of study provides continuation of the Communication Systems Engineering stream covering the remaining areas of the main stream Telecommunication Engineering. The unit is designed to provide the theoretical basis for the understanding of the engineering aspects of the design, construction, and operation of the existing and emerging Telecommunication systems. It also provides the support for students requiring basic knowledge of Telecommunication Engineering in order to handle concurrently studied Engineering Design projects that involve various aspects of Telecommunication Engineering. This has required the syllabus to be presented as a collection of lectures, the emphasis and sequence of which may be varied to accommodate the demands of any concurrent Engineering Design exercises. In addition to delivery by lecture and tutorial the unit will incorporate laboratory exercises and demonstrations of the concepts and techniques presented.
Credit Points:6

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Discuss the basic principles involved in data communication systems;
- Explain the data network architecture, operation, and performance analysis
- Evaluate the protocols employed in data networks;
- Explain the particular aspects of local area and wide area networks;
- Discuss wireless networks, their operation, and interfacing with network backbone;
- Explain the analytical techniques employed in data network performance estimation;
- Explain the basic queuing theory and its application to data networks;
- Describe data network switching and switching systems;
- 9. Discuss the principles involved in data network design and the heuristic algorithms employed;
- 10.Explain cost effective designs of local and wide area networks.

The Learning Outcomes of this unit of study will also depend upon the material presented, as required to support the concurrent PBL exercises.

Class Contact:30 hours of class contact for one semester comprising 2 hours of lecture/tutorials and 0.5 hours of laboratory work per week.
Required Reading: Forouzan, A. B. (2003). TCP/IP protocol suite. McGraw-Hill. Spohn, D. L. (2002). Data network design. McGraw-Hill.
Assessment: Continuous assessment in laboratory work (6 hours per semester) (20%); mid-semester written test (20%); end-of-semester examination (60%).

VET4300 DIGITAL COMMUNICATIONS

Locations: Footscray Park.
Prerequisites:VET3200 - DIGITAL MODULATION AND CODING
Description: Overview of Digital modulations: QPSK, OQPSK, DQPSK, MSK, GMSK, QAM. Vector space representation of digital signals, Correlation receiver, Matched filter receiver, Karhunen-Loeve representation of noise, Maximum likelihood sequence estimation (MLSE) detector, Performance in AWGN channels, Trellis coded modulation. Modem techniques: Classic PLL, Maximum likelihood carrier phase estimation, Maximum likelihood timing recovery, Adaptive equalization and echo cancellations, the LMS algorithm, decision feedback equalization.
Credit Points:6

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to:

- design common digital modulators and receivers,
- perform performance analysis of digital communication systems in AWGN channels,
- design simple equalizers and synchronizers.

Class Contact:36 hours per semester comprising 24 hours of lecture/tutorial and 12 hours of laboratory work.
Required Reading: Haykin, S. Communication Systems, 4th Edition, 2001, John Wiley & Sons; Kurzweil, J, An Introduction to Digital Communications, 2000, John Wiley & Sons.
Assessment: Assignments and class tests 30%; End of semester examination 70%.

VET4400 DIGITAL SIGNAL PROCESSING IN TELECOMMUNICATIONS 2

Locations: Footscray Park.
Prerequisites:VEG4100 Digital Signal Processing A
Description: Multi-rate signal processing: Decimation and interpolation. Applications. Multistage implementation. DSP building blocks: filter banks, correlators and matched filters.Oscillators and phase locked loops. Applications of DFT/FFT. Fast convolution and correlation. Deconvolution. Spectral analysis. Adaptive algorithms and their applications. DSP implementation: hardware and software tools.
Credit Points:6

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to:

- apply multi-rate signal processing,
- apply fast convolution,
- apply parameter estimation algorithms in the form of subsystems in telecommunication

Class Contact:36 hours per semester comprising 24 hours of lecture/tutorial and 12 hours of laboratory work.
Required Reading: Ifeachor, E.C., Jerwis, B.W. Digital Signal Processing - A Practical Approach, 2nd Edition, 2002, Pearson Prentice Hall.
Assessment: Assignments and class test 30%; End of semester examination 70%.

VET4600 WIRELESS COMMUNICATIONS

Locations: Footscray Park.

Prerequisites:VET3200 - DIGITAL MODULATION AND CODINGVET4101 - FIELD AND WAVES IN TELECOMMUNICATIONS

Description: Free space propagation, Reflection, Mean path loss, Local propagation loss, Rayleigh fading, Rician fading. Time selective channel, Frequency selective channel, Power delay profile, Coherent bandwidth, Channel estimation and tracking methods.Receiver diversity: Selective combining, Maximal-ratio combining, Equal gain combining. Transmitter diversity: Space time coded modulations, MIMO systems, Space division multiple access.CDMA: Direct sequence modulation, Gold Codes, Walsh-Hadamard sequence, RAKE receiver, Near-far problem, Power control, WCDMA, OFDM.

Credit Points:6

Learning Outcomes: On successful completion of this unit, it is expected that students will be able to:

- perform performance analysis of wireless communication systems with appropriate fading models,
- apply diversity techniques to overcome system impairment due to multi-path fading,
- understand the advantages and disadvantages of modern techniques like WCDMA and OFDM.

Class Contact:36 hours per semester comprising 24 hours of lecture/tutorial and 12 hours of laboratory works.

Required Reading: Haykin, S., Moher, M. Modern Wireless Communications, 2004, Pearson Prentice Hall; Rappaport, T. Wireless Communications, Principles and Practice, 2nd Edition, 2002, Prentice Hall.

Assessment: Assignments and class tests 30%; End of semester examination 70%.

VET6500 RESEARCH PROJECT

Locations: Footscray Park.

Prerequisites:VET6510, VET6520

Description: Each student will undertake an individual research under the guidance of an academic staff on a suitable topic, over the duration of a semester. Lectures, seminars, and regular meetings will be held collectively to expose students to research related matters such as Research Methodology, Literature Reviews, Feasibility Studies, Experiment Design, Modelling and Simulation Techniques and Tools, Results Validation and Decision Making, Report Writing, Structured Documentation, and Scientific Presentation.

Credit Points:48

Class Contact: Twelve hours per week for one semester, comprising three hours per week group seminar, three hours per week (on average) individual meetings, discussions, etc. with the respective supervisor, and six hours per week independent study including laboratory and library activity.

Required Reading: To be advised by the supervisor of the project.

Assessment: Regular seminar presentations (3 seminars, each of 20 min. duration) 30%; Final report (Approximately 25,000 words) 50%; Final presentation (of duration 40 min.) 20%; Final report is to be examined by an external examiner (who could also be present at the final presentation).

VET6501 COMMUNICATION SYSTEM MODELLING AND SIMULATION 1

Locations: Footscray Park.

Prerequisites: Nil.

Description: Introduction to research methodology. System modeling. Simulation procedures. MATLAB and its application in the design and simulation of communication subsystems. The handling of RF signals in a communications channel and the use of complex envelope representation.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply engineering skills to a given task. 2. Apply in-depth technical design of wireless sub-systems and optimise the physical layer. 3. Identify system issues and develop methodologies applicable to a given scenario. 4. Utilise a systems approach to analysis, simulation and design. 5. Gather, collate and evaluate data in a professional manner. 6. Use modeling and simulation skills as an individual and as a team player.

Class Contact: Sixty hours (60) for one semester comprising lectures and practicals.

Required Reading:N/AAttaway, T, (2009) 2nd edition Matlab-A practical introduction to programming and problem solving' Canada: Elsevier. Jeruchip, Balaban and Shanmugan (2000) 2nd edition Simulation of communications Systems New York: Kluwer.

Assessment: Project, Individual modeling project in Matlab (1.5 hours), 30%. Test, 2 Individual practical simulation tests (2 hours), 40%. Test, 1 Group modeling and simulation test (1.5 hours), 30%. Project assesses: Learning Outcomes 1, 2, 3, 4, 5, 6 and Graduate Capabilities 1,2,3,4,5,6 Individual practical simulation tests assesses: Learning Outcomes 1, 2, 3, 4, 5, 6 and Graduate Capabilities1,2,3,4,5,6 Group modeling and simulation test assesses: Learning Outcomes 1, 2, 3, 4, 5, 6 and Graduate Capabilities1,2,3,4,5,6 .

VET6502 COMMUNICATION SYSTEM MODELING AND SIMULATION 2

Locations: Footscray Park.

Prerequisites: Nil.

Description: Introduction to OPNET and other industry standard simulation tools and their application in telecommunication systems modelling and simulation.

Credit Points:12

Class Contact: Three hours per week for one semester.

Required Reading: To be advised by lecturer.

Assessment: Preliminary assignments, 40%; final assignment, 60%.

VET6510 COMMUNICATION THEORY

Locations: Footscray Park.

Prerequisites:VEF2002 - SYSTEMS AND MATHEMATICS 2B

Description: This unit aims to give a Telecommunication systems overview and introduce Information theory including self information, channel matrix, trans-information source coding, redundancy, system configuration and entropy. This unit reviews analysis techniques such as in Fourier series, properties and transforms. The unit explores Power and energy signals, power spectral density, correlation, auto & cross correlation). These are followed by a review of Modulation Techniques: (DSB, SSB, AM,FM, PM,GMSK, QPSK, QAM). In addition the unit covers spectrum & waveforms. Stochastic processes, Baseband data, Bandwidth, Gaussian noise, Noise analysis, Rise time and Filtering.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Determine design needs for a given communication link 2. Apply in-depth technical competence of telecommunications system performance and implementation 3. Identify appropriate solution to problems in given scenarios 4. Utilise a systems approach to analysis, design and operational performance of a communication system 5. Distinguish between modulation schemes applicable to a

given application 6. Determine system performance in terms of signal-to-noise ratio
Class Contact: Five hours per week, comprising lectures, tutorials, hardware and computer based labs. Total 60 Hours for the semester
Required Reading: Ziemer, R & Tranter, W (2009) 6th edition Principles of Communications NY: John Wiley & Sons Haykin,, S (2005) 5th edition Modern Wireless Communications CH: Pearson Prentice Hall N.Benvenuto et al, (2007) 4th edition Communication Systems NY: Wiley Haykin, S and Moher, M. (2009) 5th edition Communication Systems NY: John Wiley & Sons
Assessment: Test, In-class 2 Hour test, 20%. Assignment, One report of 2000 words, 50%. Examination, Final 3 Hour Examination, 30%. Test assesses: Learning Outcomes 1, 2, 3, 4. and Graduate Capabilities 1, 2, 3, 4, and 6. Assignment assesses: Learning Outcomes 1, 2, 3, 4, 5, 6 and Graduate Capabilities 1, 2, 3, 4, and 6. Final exam assesses: Learning Outcomes 1, 2, 3, 4 and 5.and Graduate Capabilities 1, 2, 3, 4, 5 and 6. .

VET6511 DATA NETWORK ANALYSIS AND DESIGN

Locations: Footscray Park.
Prerequisites: Nil.
Description: Overview of data networks. Network topologies. Physical layer interface. Synchronous and asynchronous systems. Link layer protocols. HDLC, frame relay and ATM. Error control procedures. Transmission efficiency. Types of switching. Virtual circuits. Network and transport layer protocols. X.24, IP and TCP. Point to point and multipoint systems. Access protocols. Token ring, token bus and ethernet. LANs. Bridges, routers, and gateways. Simple queuing models for data networks. Little's theorem. Networks of queues. Routing and flow control in data networks. Network congestion. Capacity assignment. Topological design of data networks. Minimum spanning tress. Heuristic algorithms. Network reliability.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.
Required Reading: Bertsekas, D and Gallager, R., Data Networks, 2nd edn, Prentice-Hall. Tanenbaum, A., Computer Networks, 3rd edn, Prentice-Hall.
Assessment: Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

VET6520 DIGITAL COMMUNICATION PRINCIPLES

Locations: Footscray Park.
Prerequisites:VET6510 - COMMUNICATION THEORY
Description: Overview of digital modulation techniques: FSK, QPSK, QAM, CPM, OFDM; their spectral analysis and BER performance calculation in AWGN. Maximum-Likelihood Sequence Estimation (MLSE) detector and MAP detector for linear modulations.Carrier and Symbol Synchronization techniques. Decision-Directed Phase Locked Loop (PLL) and Non-Decision-Directed PLLs. Maximum-Likelihood Timing Estimation. Joint estimation of carrier phase and symbol timing.Convolutional codes. Transfer function. Optimum decoding using Viterbi Algorithm. Error probability for soft-decision decoding of convolutional codes. Coded modulation; Trellis Coded Modulation (TCM). Space-Time Coding for MIMO systems.Channel equalization. Blind equalizations based on maximum likelihood (ML) criteria, stochastic gradient algorithm, and higher order signal statistics.Multi-user Communications. Direct sequence CDMA. Frequency hoping CDMA. RAKE receivers.
Credit Points:12
Class Contact: Three hours per week, comprising lectures, tutorials and seminars.
Required Reading: Proakis, J.G., 2002, Digital Communications, 4th edition, McGraw-Hill International.
Assessment: Class test (Two Hours) 20%; Assignment (report not exceeding 5000 words) 20%; Final examination (Three Hours) 60%.

VET6521 DIGITAL SWITCHING AND SIGNALLING SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: Historical development of telecommunication switching systems. Switching system limitations. Single and multistage switches. Limited availability switches. Digital switching principles. Time and space switching matrices. Modern generation of electronic exchanges. Network hierarchy. Routing operations. Local and national networks. Tandem networks. Modern PABX systems. Voice and data traffic integration. Concept of ISDN. Signalling systems in telecommunication networks. CCS No. 7 signalling system.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.
Required Reading: To be advised by the lecturer.
Assessment: Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

VET6522 TELECOMMUNICATION TARIFF STRUCTURES AND TELETRAFFIC ENGINEERING

Locations: Footscray Park.
Prerequisites: Nil.
Description: Basic telecommunication tariff structures and their formulation. Engineering, Economic, Social, and Political considerations in tariff policy setting. Global operation and international agreements. Local, interstate and international call accounting. Inter-carrier call accounting. Network operator, service provider and customer partnerships. Service differentiation between voice, data and ISDN connections. Tariff policies in broadband, interactive multimedia and Internet connections. Tariff regimes in cellular mobile systems. Teletraffic engineering principles. Queuing theory. Loss Systems Delay systems. Availability. Dynamic equivalence. Erlang's formulas. Network dimensioning. Dynamic routing. Minimum network design. Network traffic management techniques. Network management.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.
Required Reading: To be advised by the lecturer.
Assessment: Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

VET6531 WIRELESS COMMUNICATION SUBSYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit will provide students with a theoretical and practical understanding of wireless communication systems and the subsystems involved in them. It provides an overview of existing wireless systems with special reference to its hardware implementation. Unit content will include Noise and Distortion, Duplexing methods, Propagation modeling at UHF. Path loss, free space and plane earth models. In particular, Okumura's model will be used in Radio link design.Students are expected to take into account Shadowing, Rayleigh multipath fading, fade duration and level crossing rate and Delay spread when developing a link budget. In addition, coherence bandwidth. Antenna parameters, Diversity systems. Multiple-Input-Multiple- Output (MIMO), Interference cancellation,

Modulation and coding for the mobile channel are topics that will be taught..
Credit Points:12

Learning Outcomes: On successful completion of this unit students are expected to be able to:

- Select appropriate radio hardware components to meet a specified dynamic range (noise and third order distortion) specification for wireless equipment.
- Identify the difference between different duplexing methods and know the performance trade-offs between them Perform basic path loss estimation and radio link design, using hand calculations or specialised prediction software.
- Analyse the causes of radio frequency fading and identify the most appropriate diversity countermeasure to this fading.
- Distinguish between different MIMO modes of operation.

Class Contact:60 hours for one semester comprising lectures, labs and tutorials.
Required Reading: Wong, D. K. (2012) 5th edition Fundamentals of wireless Communications Hoboken: Wiley Rappaport T,S. (2007). 2nd edition Wireless Communications. New Jersey:Prentice-Hall. Molisch, A. F. (2005). 2nd edition Wireless Communications. Chichester:Wiley.
Assessment: Examination, Final examination (3 hours), 40%. Laboratory Work, 2 laboratory reports (3 pages) on design software (15% each), 30%. Test, 6 short tests (20 minutes each), 30%. Examination assesses: Learning Outcomes 2, 3, 4, 5 and Graduate Capabilities 1, 2, 3, 4 and 6 Laboratory assesses: Learning Outcomes 1,2,3,4,5 Graduate Capabilities1, 2, 3, 4, 5 and 6 Test assesses: Learning Outcomes 2,3,4,5 and Graduate Capabilities 1, 2, 3, 4 and 6 .

VET6532 MICROWAVE AND SATELLITE COMMUNICATION SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: Principles of modern microwave systems planning and design. Microwave propagation. Beam bending, K-factor and Fresnel zone clearance. Free space loss calculation. Multipath propagation. Component characterisation. Microwave antennas, oscillators, amplifiers, mixers, filters, isolators. Modulation schemes for analog and digital radio systems. Multiplexing techniques and system loading effects. Microwave link planning and design techniques. Noise budget calculations. Reliability calculations. Evolution of satellite technology and applications. Satellite communication systems for both domestic and international traffic. Satellite links and access methods. Satellite orbits. Elevation angles. Geo-stationary orbits. Communication satellite design. Satellite antenna systems. Global beam and spot beam antennas. Beam shaping techniques. Polarisation and frequency re-use techniques. System EIRP and figure of merit Effects of system non-linearity. FDMA, TDMA, SCPC and SPADE system design. Satellite link design. Up-link, down-link and loss calculations. Multichannel system calculations. On-board regeneration. Link power control Propagation delay and echo cancellation. Direct broadcasting satellites. VSAT Networks. Mobile satellite networks. GEO, LEO and MEO systems. Satellite system management. Frequency co-ordination and regulation.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.
Required Reading: Elbert, B., 1992, Introduction to Satellite Communication, Artech House.
Assessment: Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

VET6541 MULTIMEDIA AND INTERNET TECHNOLOGY

Locations: Footscray Park.
Prerequisites: Nil.
Description: Characteristics and requirements of multimedia telecommunication services. Media integration. Multimedia communications supporting technologies. Digital audio, image, and video compression principles. techniques, and standards. Super high definition images. Image capture systems. Image processing and image coding algorithms. End-to-end quality of service guarantee and management for audio and video communications. Network support of multimedia communications. Multimedia transport protocols. End system architectures. Multimedia servers. Networked multimedia synchronisation requirements and mechanisms. Multimedia workstations and servers. Information super highways. Internet. HTML. Java and objected oriented programming.
Credit Points:12
Class Contact: Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.
Required Reading: Lu, G., 1996, Communication and Computing for Distributed Multimedia Systems, Artech House.
Assessment: Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

VET6542 MOBILE AND PERSONAL COMMUNICATION SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: This unit gives an overview of cellular systems. Students are taught Capacity calculations, Cell site engineering, Cell splitting and sectoring. Cellular network access mechanisms such as FDMA, TDMA and CDMA are analysed. Topics of interest such as Simplex, Half Duplex, Full Duplex, DSSS and Frequency Hopping are also taught. The unit further explores Spectral efficiency, Air link interface, Radio resource management, Mobility management, Handover and general Cellular traffic. In addition,Cellular networking, Micro and macro cellular systems, GSM, WCDMA, LTE systems. and Mobile data networks are topics the unit covers. The wireless enterprise, PMR, Simulcast, Trunking, Standardisation, Security issues, Regulatory environment, Emerging and Future Standards are also covered.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Perform basic cell planning for a wireless communications system. 2. Evaluate wireless system performance in terms of quality of service and grade of service. 3. Operate radio cell planning software tools. 4. Describe the operation of the key wireless standards, GSM, WCDMA and LTE. 5. Describe the operation and identify strengths and weaknesses of popular wireless multiple access techniques.
Class Contact:60 hours for one semester comprising lectures, tutorials. Additional self directed learning comprising assignments, projects and laboratory work.
Required Reading: Holma, H., & Toskala, A. (2009). ISBN 978-0-470-99401-6. LTE for UMTS, OFDMA and SC-FDMA Based Radio Access. Chichester:Wiley. Holma, H., & Toskala, A. (2007). (4th ed.). WCDMA for UMTS - HSPA Evolution and LTE. Chichester:Wiley. Molisch, Andreas F. (2005). ISBN 13 978-0-480-84888-3. Wireless Communications. Chichester:Wiley.
Assessment: Examination, Final examination (2 hours), 50%. Test, Class tests (approximately (8), 30%. Laboratory Work, 2 Laboratory reports (2 pages) using EDX software (10% each), 20%. 1. Examination covers learning outcomes 2,4,5 and graduate capabilities 1,2,3,4,5 and 6 2. Test covers learning outcomes 2,4,5

and graduate capabilities 1,2,3,4,5 and 6 3. Laboratory covers learning outcomes graduate capabilities 1,2,3,4,5 and 6 .

VET6550 MINOR PROJECT

Locations: Footscray Park.

Prerequisites:VET6520 - DIGITAL COMMUNICATION PRINCIPLES

Description: Each student will undertake an individual research on a topic allocated to him or her under the supervision of an academic staff over the duration of a semester. Regular meetings will be held between the students and their supervisors in the form of seminars where students will report their progress in the form of formal presentations. In addition, informal meetings between students and their supervisors will take place as and when required. In the process, the student will be exposed to research related matters such as Research Methodology, Literature Reviews, Feasibility Studies, Experiment Design, Modelling and Simulation Techniques and Tools, Results Analysis and Validation, Report Documentation and Presentation.

Credit Points:24

Class Contact: Six hours per week for one semester, comprising three hours per week group seminar, and three hours per week (on average) individual meetings, discussions, etc. with respective supervisors.

Required Reading: To be advised by the supervisor of the project.

Assessment: Regular seminar presentations (3 seminars, each of 20 min duration), 30%. Final report (Approximately 12,000 words) 50%. Final presentation (of 30 min. duration), 20%

VET6551 MICROWAVE ELECTRONIC CIRCUIT DESIGN

Locations: Footscray Park.

Prerequisites: Nil.

Description: This subject will provide an introduction to microwave electronic circuit design based around the 'Microstrip' transmission line structure. Students will be given small design projects to complete operating at the frequencies relevant to mobile communications (ie. 0.9 to 3 Ghz). Extensive use will be made of Agilent's simulation and design package, ADS and other software packages in this course. Subject content: A review of basic transmission line theory. A review of microwave transmission structures. A discussion of corrections for microstrip discontinuities. a review of the Smith Chart. Consideration of matching requirements for small signal amplifiers. A review of matching techniques. Bias circuit design and power amplifier design. Passive RF Components.

Credit Points:12

Class Contact: Three hours per week for one semester comprising one hour lecture and two hour tutorial/laboratory.

Required Reading: Gonzadez, G., 1984, Microwave Transistor Amplifiers - Analysis and Design, Prentice-Hall.

Assessment: Assignments: 60%; Examination/test: 40%. A pass in each component of assessment is required for a subject pass.

VET6552 COMPUTER NETWORKS AND NETWORKING SOFTWARE

Locations: Footscray Park.

Prerequisites: Nil.

Description: Computer systems architecture and organisation. Communication controllers. Ports and buffers configuration and management. Computer networking principles. Network operating systems. Computer communication protocol architecture, their design, verification and implementation. Internetworking. Network layer protocols. Ip. Internet addressing and route management. Address resolution protocols. Transport service primitives. Connection establishment and release. Connection management. Time management. Network performance issues. Internetwork transport protocols. TCP and UDP. Port numbers. Domain naming systems. Interior and exterior gateways. Network management protocols. Electronic mail. Simple mail transfer protocols. File transfer protocol. Network file systems. Terminal emulation. Telnet.

Credit Points:12

Class Contact: Three hours per week for one semester comprising two hour lecture and one hour tutorial/laboratory.

Required Reading: Pabrai, U.O., 1995, UNIX Internetworking, Artech House.

Assessment: Tests/Assignments: 40%; Examination: 60%. A pass in each component of assessment is required for a subject pass.

VET6562 DIGITAL SIGNAL PROCESSING

Locations: Footscray Park.

Prerequisites:VEF2002 - SYSTEMS AND MATHEMATICS 2B

Description: The unit will provide a theoretical and practical understanding of digital signal processing techniques. Particular emphasis is placed on applications to telecommunication circuit design,implementation and examines aliasing, quantisation, Signal reconstruction and distortion. The unit explores amplification dynamic ranges, and round-off errors in signal processing. The unit highlights IIR digital filter design, Bilinear transformation, impulse invariant methods, and FIR digital filter design. Other topics of interest include Windowing, Frequency sampling, Minimum phase and linear phase filter design. The effects of sampling rate variation, Decimation and interpolation and Adaptive filtering are also covered. In addition, LMS algorithms and their applications are covered. The unit further explores SO implementations of modulators, oscillators, limiters, phase shifters and other circuits. Design of modems, voice coders, image processors, and antenna beam formers are other topics the unit covers.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Interpret theoretical and practical digital signal processing techniques. 2. Apply DSP applications to telecommunication circuit design and implementation. 3. Examine and analyse Aliasing, Quantisation. Signal reconstruction and distortion. Dynamic ranges. Round-off errors. IIR digital filter design and FIR digital filter design. 4. Analyse the effect of sampling rate variation, decimation, and interpolation in adaptive filtering, 5.Design modems, voice coders, image processors, and antenna beam formers.

Class Contact:5 hours per week, 60 hours for one semester comprising 3 hour lecture and 2 hour tutorial/laboratory.

Required Reading: To be advised by lecturer.

Assessment: Examination, 3 hour final examination, 50%. Test, 1 mid - semester test (2 hours), 30%. Assignment, Written 1500 words, 20%. Examination assesses: Leaning Outcomes 1, 2, 3, 4, 5 and Graduate Capabilities 1, 2, 3, 4, and 6 Test assesses Leaning Outcomes 1, 2, 3, 4, 5 and Graduate Capabilities 1, 2, 3, 4, and 6 Assignment assesses Leaning Outcomes 1, 2, 3, 4, 5 and Graduate Capabilities 1, 2, 3, 4, 5 and 6. .

VMR8001 RESEARCH THESIS 1 FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the

following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:48

VMR8002 RESEARCH THESIS 2 FULL TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:48

VMR8011 RESEARCH THESIS 1 PART TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:24

VMR8012 RESEARCH THESIS 2 PART TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:24

VPAU582 UNDERTAKE SITE SURVEY AND ANALYSIS TO INFORM DESIGN PROCESS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to undertake a site survey and a site analysis for residential and commercial building projects. It includes the use of basic measuring and levelling equipment, recording and interpretation of data, and evaluation of, and compliance with relevant legislation.

Required Reading: Building Codes 2009 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber Framing Manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete Footings & Slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU583 APPLY STRUCTURAL AND CONSTRUCTION TECHNOLOGY TO THE DESIGN OF RESIDENTIAL BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply structural and construction technology to the design of residential buildings. It requires compliance with state legislation and the provisions for BCA Classes 1 and 10 and relevant Australian Standards as they apply to the structural and construction components of a residential building.

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU584 APPLY STRUCTURAL AND CONSTRUCTION TECHNOLOGY TO THE DESIGN OF COMMERCIAL BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply structural and construction technology to the design of commercial buildings. It requires compliance with state legislation and the provisions for BCA Classes 2 to 9 and relevant Australian Standards as they apply to the structural and construction components of a commercial building.

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU585 COMPLY WITH CODES AND STANDARDS IN THE DESIGN OF RESIDENTIAL BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to access, interpret and apply relevant building codes and standards to the design of residential buildings. It includes the ability to apply a range of design solutions for residential buildings (BCA Classes 1 and 10), in compliance with the Building Code of Australia (BCA) and make recommendations for alternative solutions as required. It requires thorough knowledge of the purpose and content of the Building Code of Australia (BCA).

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU586 COMPLY WITH CODES AND STANDARDS IN THE DESIGN OF COMMERCIAL BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to access, interpret and apply relevant building codes and standards to the design of commercial buildings. It includes the ability to apply a range of design solutions to the construction or design of a commercial building (BCA Classes 2 to 9), in compliance with the Building Code of Australia (BCA) and make recommendations for alternative solutions as required. It requires thorough knowledge of the purpose and content of the Building Code of Australia (BCA).

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU587 DESIGN SAFE BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply safe design principles to control OHS risk during the life of a building. It includes the ability to identify and comply with legal responsibilities and obligations and evaluate OHS hazards associated with the design, construction and use of a building during its life cycle. Applying safe design principles requires consultation with stakeholders and specialist advisors and the ability to make recommendations for alternative design solutions and incorporate risk controls into the building design and end use.

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU588 DESIGN SUSTAINABLE BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply the principles of sustainability to building design. It includes the application of sustainable practices to minimise negative impacts of the construction process and land use on the environment, incorporate passive design, sustainable water use and energy efficiency into a building design and select suitable materials for the construction of the building. It requires compliance with relevant legislation, Australian Standards and the Building Code of Australia (BCA).

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU589 INTEGRATE SERVICES LAYOUT INTO DESIGN DOCUMENTATION

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to integrate the layout of services and connections into building design documentation for residential (BCA Classes 1 and 10) and commercial (BCA Classes 2 to 9) buildings. It includes the knowledge and application of current sustainable and energy efficient practices and appliances and involves consultation with other professionals to obtain agreement on service layout details and specifications. It requires compliance with relevant legislation, Australian Standards and the Building Code of Australia (BCA).

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU590 PRODUCE WORKING DRAWINGS FOR RESIDENTIAL BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies outcomes required to produce two and three-dimensional drawings in accordance with standard industry practice and to a level suitable for building permit approval applications. It includes the ability to read and interpret plans and specifications and to produce working drawings for residential buildings (BCA Classes 1 and 10).

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manualAs 2870 - Concrete footings & slabs Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU591 PRODUCE WORKING DRAWINGS FOR COMMERCIAL BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies outcomes required to produce two and three-dimensional drawings in accordance with standard industry practice and to a level suitable for building permit approval applications. It includes the ability to read and interpret plans and specifications and to produce working drawings for commercial buildings (BCA Classes 2 to 9).

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU592 SELECT CONSTRUCTION MATERIALS FOR BUILDING PROJECTS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to evaluate and select a range of suitable construction materials for building projects, taking into account a range of criteria including physical attributes, cost and sustainability. It includes the ability to analyse properties and characteristics to determine their suitability for application in the construction of a building. It requires selection of materials that comply with relevant legislation, Australian Standards and the Building Code of Australia (BCA).

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU593 PROVIDE DESIGN SOLUTIONS FOR RESIDENTIAL AND COMMERCIAL BUILDINGS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to apply the theories and principles of design to the design of buildings. It can be applied to both residential buildings (BCA Classes 1 and 10) and commercial buildings (BCA Classes 2 to 9). It requires the ability to research, analyse and evaluate information on the history and elements of architecture and their influence on current practice. It includes developing a design response which meets the requirements of a project brief, and communicating a final design solution to relevant stakeholders.

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU594 INTEGRATE DIGITAL APPLICATIONS INTO ARCHITECTURAL WORKFLOWS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to use a range of digital applications in architectural workflows. It includes the ability to determine the appropriate digital applications required for specific project outputs and the application of architectural standards and conventions to produce and manage the project. Work is likely to be undertaken with limited supervision and in consultation with team members and external consultants.

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU595 PRESENT ARCHITECTURAL DESIGNS

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to present a design concept for an architectural project. The design could be for a residential (BCA Classes 1 and 10) or commercial (BCA Classes 2 to 9) building. It includes reviewing the project brief, developing presentation materials and presenting the final design concept to relevant stakeholders. Materials for presentation could include sketches, computer generated drawings/images, or models. It requires the ability to effectively clarify or communicate ideas and the design concept to stakeholders.

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU596 MANAGE ARCHITECTURAL PROJECT ADMINISTRATION

Locations: Newport.

Prerequisites: Nil.

Description: This unit of competency specifies the outcomes required to manage architectural administration and the development of project documentation. It requires the knowledge of the legislation pertaining to project administration and the ability to comply with the organisational requirements for quality assurance. Work is expected to be undertaken in consultation with both internal personnel and external consultants and with limited supervision.

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge -

Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPAU597 UNDERTAKE COMPLEX ARCHITECTURAL PROJECTS

Locations: Newport.

Prerequisites: Nil.

Description: This unit specifies the outcomes required to undertake complex architectural projects for residential (BCA Classes 1 and 10) and/or commercial (BCA Classes 2 to 9) buildings. It includes consultation with a client to prepare a project brief and the development and presentation of a design concept that meets the requirements of the brief and relevant legislative requirements and codes and standards. It requires the preparation of all necessary documentation and the development of a critical path management diagram. It requires thorough knowledge of the Building Code of Australia (BCA), relevant Australian Standards and local authority regulatory requirements.

Required Reading: Building Codes Board 2009 Building Code of Australia Canprint - Canberra Australian Standards 2009 As 1684.2 - Timber framing manual Canprint - Canberra Australian Standards 2009 As 2870 - Concrete footings & slabs Canprint - Canberra

Assessment:- Assessment will satisfy the endorsed assessment guidelines of the VQA endorsed Adv Dip of Building Design (Architecture) 21953VIC Training Package - Assessment methods will confirm consistency & accuracy of performance together with application of underpinning knowledge - Assessment will be by direct observation of tasks, with questioning on underpinning knowledge & it must also reinforce the integration of key competencies - Assessment methods will confirm the ability to access & correctly interpret & apply the essential underpinning knowledge - Assessment will be applied under project related conditions (real or simulated) & require evidence of process - Assessment will confirm a reasonable inference that competency is able not only to be satisfied under the particular circumstance, but is able to be transferred to other circumstances - Assessment will be in conjunction with assessment of other units of competency, including those listed above

VPM5000 INTERMODAL FREIGHT MARKETS - DYNAMICS AND STRUCTURE

Locations: Werribee.

Prerequisites: Nil.

Description: This subject is concerned with the way in which rapidly restructuring logistics and freight handling systems are impacting on the efficiency and effectiveness of service providers in integrated and intermodal freight markets. It focuses particularly on developing concepts, skills and techniques that will assist transport professionals and managers in intermodal freight handling firms not only to understand the economic and competitive drivers in the market place but also how to define their corporate 'product' and the way in which they do business. The subject meshes principles with practice and is developed within a framework or a detailed understanding of the Australian freight industry and its operations and practice, and it is informed also by extensive experience in Southeast Asian and Pacific Rim countries, in the United States and in Europe.

Credit Points:16

Class Contact: Forty five hours of block mode teaching.

Required Reading: Course Handbook provided to each student.

Assessment: Case study and seminar presentation, 10%; Syndicate group project, 40%; Research report, 50%.

VPM5001 INTEGRATING INTERMODAL FREIGHT SYSTEMS

Locations: Werribee.

Prerequisites:VPM5000 - INTERMODAL FREIGHT MARKETS - DYNAMICS AND STRUCTURE

Description: This subject focuses on the need to create seamlessness in transport services and operations that span complex networks involving different modes and many interface points - depots, terminals, warehouses, ports, for example. It recognises that intermodal efficiency may not be easily achieved; and that action may be required on many fronts - including operational capacity matching, alliance formation, information and e-Business streamlining, rationalising chain structures, eliminating market structure inefficiency and harmonising policies and policy frameworks. Particular attention is paid to capacity measurement, provision and adjustment in freight networks; to efficiency costs and pricing frameworks; to ways and means of achieving efficient chain and supply chain structures; and to overcoming policy and regulatory constraints. This subject draws heavily not only on the Australian freight industry but also on international experience.

Credit Points:16

Class Contact: Forty five hours of block mode teaching.

Required Reading: Course Handbook provided to each student.

Assessment: Case study and seminar presentation, 10%; Syndicate group project, 40%; Research report, 50%.

VPM5002 DEFINING STRATEGIES FOR INTERMODAL FREIGHT SYSTEMS

Locations: Werribee.

Prerequisites: Nil.

Description: This subject builds on the concepts, skills and techniques developed in VPM5000 and VPM5001. In those subjects students examined the nature of the intermodal freight market and the role of the intermodal service provider in it; and the ways and means of managing to achieve seamless and efficient operations. In this subject the guiding questions are strategic ones and focus on positioning the firm for the future. More particularly, the subject develops a strong understanding of the notion of strategy and of an adequate conceptual framework within which to define strategies. It also outlines some quite specific attributes of strategy for intermodal firms and for the effective achievement of integrated freight networks. This subject draws heavily not only on the Australian freight industry but also on international experience.

Credit Points:16

Class Contact: Forty five hours of block mode teaching.

Required Reading: Hamel, G. and Prahalad, C.K., 1994, Competing for the Future, Harvard Business School Boston. Course Handbook provided to each student.

Assessment: Case study and seminar presentation, 10%; Syndicate group project, 40%; Research report, 50%.

VPM5003 ADVANCED CHAIN SYSTEMS MANAGEMENT

Locations: Werribee.

Prerequisites: Nil.

Description: This subject focuses on managing firms in chain systems to achieve fully integrated, rather than highly segmented and atomistic chains. It is concerned with ways and meand of trading off system efficiency and costs in such a way as to deliver maximum customer value under varying economic and policy scenarios. This unit will ad further to the students' understanding of process mapping, the design of static and dynamic KPIs and dynamic modelling solutions for efficient chains.

Credit Points:16

Class Contact: Teaching for each unit is over a five day block.

Required Reading: Current available text book - student to be advised.

Assessment:A seminar paper, 10%; Group syndicate work, 40%; Research report, 50%.

VPM5004 FINANICAL AND INVESTMENT PLANNING IN CHAIN SYSTEMS MANAGEMENT

Locations: Werribee.

Prerequisites: Nil.

Description: Third party service providers, like other firms, must understand the relationship between the costs of investments and the use of capital and the benefits of investment. The timing of investments, cost/price relationships and the risks associated with investment are of exceptional importance to business success. This unit focuses on these issues and introduces students to concepts, financial modelling and technique for developing investment scenarios.

Credit Points:16

Class Contact: Teaching for each unit is over a five day block.

Required Reading: Current available text book - student to be advised.

Assessment:A seminar paper, 10%; Group syndicate work, 40%; Research report, 50%.

VPM5005 STRATEGY, STRATEGIC OPTIONS AND BUSINESS SUCCESS IN CHAIN SYSTEMS MANAGEMENT

Locations: Werribee.

Prerequisites: Nil.

Description: Rapid and continuing changes in complex intermodal and chain systems are resulting in significantly increased competitive pressures for third party service provider firms. What strategic options are available to stakeholder firms? And on what basis can the traditional 'transport provider' firms achieve sustained business success? This unit examines in depth the basis for business success and examines particularly the notions of market andsupply chain power and draws on current research into real-world examples to provide guidance for stakeholder firms.

Credit Points:16

Class Contact: Teaching for each unit is over a five day block.

Required Reading: Current available text book - student to be advised.

Assessment:A seminar paper, 10%; Group syndicate work, 40%; Research report, 50%.

VPM5006 BLK FRGHT MRKT AND SUPPLY CHAIN: DYN AND STR

Prerequisites: Nil.

Credit Points:16

VPM5007 MANAGING BULK SUPPLY CHAINS

Prerequisites: Nil.

Credit Points:16

VPM5008 DEFINING STRATEGIES FOR BULK FREIGHT SYS

Prerequisites: Nil.

Credit Points:16

VPM6000 MINOR THESIS

Prerequisites: Nil.

Credit Points:48

VPP5600 PRINCIPLES OF PROJECT MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit of study (UoS) will introduce and define project management as applicable to the concept, development design and documentation, procurement and maintenance, of any facilities including buildings and infrastructure. To introduce participants to Project Management Principles and learn about working in a project team environment. The UoS examines the following topics. Introduction to Project Management: PM's role in achieving a successful project in industry and environment; definitions of the Management and Project Management. Trends in project management - historically and the current environment; managerial perspective; trend towards various modes of project delivery. Comparison of performance in public/private sectors; overview of future developments. The interrelationship between owner, developer, financial sources, designers and contractors. Role and task of functional activities of project managers: setting of project objectives; feasibility analysis; setting of budget; control of contract time and quality; risk apportionment between various parties. Design to user requirements: planning for life-cycle of the facility; management of small to medium size projects; role descriptions of project manager, architect, consultants and owners. Environmental and social constraints. Preparation EIS for building development project. Case studies illustrating the various aspects of project management.

Credit Points:12

Learning Outcomes: It will equip professionals already in industry with advanced principles and techniques of project management to enable them to assume the role of project manager and/or become effective members of project management teams.

Class Contact: Three hours per week for one semester.

Required Reading: Formal class notes will be provided to students for each UoS. These notes are reviewed and updated regularly.

Assessment: Assignments, 20%; group project, 40%; examination, 40%. Students must attain a mark of 50% in each assessable component to pass this UoS.

VPP5610 PROJECT PLANNING AND CONTROL

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit of study (UoS) will review the development process of a project from its inception through to feasibility and go-ahead decision; detail design documentation, construction commissioning and life cycle planning; evaluate the role and function of Project Management in this process; explain the purpose and to detail the theoretical basis of various techniques used for planning and managing the process. The UoS content includes: Systems approach to project planning; basic principles and theory of systems analysis; current trends in community project planning. Overview of UoS and introduction to project. Management of a Public Interest Project . Preparation of financial feasibility of a development project: factors involved, issues to be considered at concept stage; introduction of a case study. Capital decision making for project managers; cost concepts and cost factors. Project control and cost planning at feasibility and design stage. Cost versus quality assurance. Project control during development phase; breakdown of the project for estimating, budgeting and financial control; project time planning; networks and other scheduling techniques; resource levelling; line of balance concepts. Project cost planning and control in public sector; pre-development cost control, development cost control; cost control method: data support system to cover contingency, indexation and methods of monitoring and reporting. Project team planning: duties and responsibilities of the project manager. Planning techniques for repetitive construction, multi-activity chart; principles of production engineering applied to repetitive processes in projects; special problems of repetitive projects. Principles of decision analysis; review of mathematical theory; application to decision process under uncertainty. Value engineering concepts and its application to design and development; application of value analysis in project management. Role and responsibilities of client s member on P.M. team; risk sharing at various stages of project between the parties involved in the process; role of P.M. in client awareness of risks and rewards.

Credit Points:12

Learning Outcomes: It will equip professionals already in industry with advanced principles and techniques of project management to enable them to assume the role of project manager and/or become effective members of project management teams.

Class Contact: Three hours per week for one semester

Required Reading: Formal class notes will be provided to students for each UoS. These notes are reviewed and updated regularly.

Assessment: One major group project, 40%; two individual assignments, 20%; examination, 40%. Students must attain a mark of 50% in each assessable component to pass this UoS.

VPP5620 PROJECT STAKEHOLDERS MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: The unit of study (UoS) will develop an understanding and appreciation of management environment in Australia; evaluate current state of standard forms of contracts and its relevance to procurement of buildings by project management techniques. The UoS examines formal organisational structures; role of project manager. Evaluation of managerial thought; management process - human and organisational aspect; human behaviour in organisations; current trends in organisational structure; comparison of U.S. and Australian management scene; overview of Australian management trends in construction industry. An introductory examination of the Australian legal system. The role of Parliaments and the process of passing and the effect of legislation. The authority and the hierarchy of the Courts. General principles of contract law. An examination of the new draft form of AS4000 form of contract. A comparison of standard forms of contracts. An outline of the law relating to the principles concerning project management. Examination of the different types of project management. Formation of a contract. Terms of a contract. Avoidance. Discharge of a contract. Remedies. Quantum merit. Contractual and working relationship between various stakeholders in the project. Roles and Responsibilities of each stakeholder; risk apportionment between various stakeholders as well as determination of risks to be covered by insurances, bonds or other instruments.

Credit Points:12

Learning Outcomes: It will equip professionals already in industry with processes and knowledge to deal with project scenarios. It will enable them to assume the role of and participating in the various functions involved in the project. The UoS will make the various stakeholders aware of their responsibilities as well as their liabilities.

Class Contact: Three hours per week for one semester

Required Reading: Formal class notes will be provided to students for each UoS. These notes are reviewed and updated regularly.

Assessment: By assignments and projects and class participation. Assignment 1, 30%; exercises and assignments, 60%; class participation, 10%. Students must attain a mark of 50% in each assessable component to pass this UoS.

VPP5621 PROJECT RISK MANAGEMENT

Locations: Footscray Park.

Prerequisites: Nil.

Description: This unit of study (UoS) studies the fundamentals of risk management and risk management theories in relation to projects, definitions of risks and opportunities, risk management system, risk identification and classification, risk probability and impact, qualitative risk analysis techniques, quantitative risk analysis techniques, risk treatment methods, decision making, risk perception, risk communication, risk analysis software introduction, risk versus opportunity. Case studies are used to examine and develop understanding of risk management system and its implementation.

Credit Points:12

Learning Outcomes: Upon completion of the UoS, the students should be able to understand risk and risk profile in a typical project, conduct a simple risk assessment and develop a risk management plan.

Class Contact: Three hours per week for one semester.

Required Reading: Formal class notes will be provided to students for each UoS. These notes are reviewed and updated regularly.

Assessment: Assignments, 50%; Exam, 50%.

VPP5630 RESEARCH METHODS

Locations: Footscray Pardk.

Prerequisites: Nil.

Description: This unit of study (UoS) aims at informing students of the range of research methods appropriate to the project management discipline and developing basic skills for carrying out research. It introduces nature of research, types of research, research problems and objectives, literature review, research design, research ethics, data collection, measurement and analysis methods, typical qualitative and quantitative methods, development of research proposal, advanced information retrieval skills, etc.

Credit Points:12

Learning Outcomes: Upon the completion of this UoS, the students should develop an understanding of research skills, techniques and methodologies for the completion of a full research proposal.

Class Contact: Three hours per week for one semester.

Required Reading: Formal class notes will be provided to students for each UoS. These notes are reviewed and updated regularly.

Assessment: Assignment 1 (40%); Assignment 2 (Oral 20% and Report 40%)

VPP5640 PROJECT GOVERNANCE

Locations: Footscray Park.

Prerequisites: Nil.

Description: Effective project decision making is recognised as a key feature of successful projects. Ineffective decision making leads to project delay and failure. Project Governance takes participants through the logical steps required for the establishment of a project governance framework for a project or organisation. Starting with problems typical of ineffective project governance, it develops a set of principles designed to overcome these problems and builds a framework based on these principles. Understanding and developing a comprehensive guide demonstrates how to populate the framework effectively, provides the accountabilities and responsibilities of the main roles, and describes how to integrate the project governance framework into the organisation. Whether participants are a project management practitioner or a student of project management.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Establish the importance of project governance;
- Evaluate the causes and symptoms of ineffective project governance;

- Apply the principles of effective project governance and developing the project governance framework model;
- Assess the issues in implementing the project governance framework;
- Assess the governance relationship between programmes and projects;
- Apply the process towards an integrated project delivery framework.

Class Contact: Thirty-six (36) hours for one semester comprising lectures, seminars and group activities.
Required Reading: Renz, P. S. (2007). Project governance. Springer E-books. Rezaee, Z. (2009). (2nd ed.). Corporate governance and ethics John Wiley & Sons.
Assessment: Unit assessment is based on the final examination and assignments. Examination, Final Examination, 50%. Assignment, Assignment 1, 25%. Assignment, Assignment 2, 25%.

VPP5716 PROJECT DEVELOPMENT ANALYSIS AND REVIEW

Locations: Footscray Park.
Prerequisites: Nil.
Description: The unit will develop skills and techniques to assess and manage projects and to appreciate the role and objectives of project managers and developers. Unit content examines management of project in the economy: An overview: typology of relationship between property, project management and property management. Feasibility and economic issues in development of project: Elements of a project development feasibility study. Parameters of project investment. Decisions including market analysis and financial evaluation techniques. Project investment criteria and considerations. Management of the development process (a client perspective): client briefing; formation of project team; design management, construction and financial management, project marketing. Financial feasibility - Case study and methods of evaluation. Law and property management - Strata titles; standard mortgage clauses; standard lease agreements. Land valuation and techniques for valuing project and property. Market survey and predictions - impact of macro-economic conditions on decisions to develop; marketing of space.
Credit Points:12
Learning Outcomes: On successful completion of this unit, students are expected to be able to: 1. Apply project development processes to assess and manage projects; 2. Describe the role and objectives of developers and project managers.
Class Contact: Thirty six (36) hours for one semester comprising lectures, computer laboratory sessions, seminars and workshops.
Required Reading: Formal class notes will be provided to students for each UoS. These notes are reviewed and updated regularly.
Assessment: Assignment, Individual assignment, 15%. Project, Group project, 45%. Examination, End-of-semester examination, 40%. Students must attain a mark of 50% in each assessable component to pass this UoS.

VPP6511 FIBRE OPTIC COMMUNICATION SYSTEMS

Locations: Footscray Park.
Prerequisites: Nil.
Description: Review of basic optical theory: Optical fibres. Attenuation in silica optical fibres. Modes in slab waveguides. Modes in optic fibres. Dispersion and distortion in optical fibres. Sources for optical fibre systems. Detectors for fibre optic systems. Noise in detector systems. Fibre optic communication systems. Fibre fabrication.
Credit Points:12
Class Contact:36 hours lectures/tutorials/laboratories
Required Reading: Palais, J.C. 2005, Fibre Optic Communications, 5th edn, Prentice-Hall, NJ.
Assessment: Two assignments (each assignment report not exceeding 5000 words) 10% each; Two laboratory reports (word length of each not exceeding 2500 words) 10% each; Final examination (Two Hours) 60%.

VPP6512 ADVANCED FIBRE OPTICS

Locations: Footscray Park.
Prerequisites:VPP6511 - FIBRE OPTIC COMMUNICATION SYSTEMS
Description: Maxwell's Equations for waveguides, boundary conditions and eigenvalue equations, planar dielectric waveguides and their modes, cylindrical dielectric waveguides and their modes, LP mode description, Gaussian approximation, dispersion in multimode and single mode fibres, normal mode theory of single mode fibre couplers. Role of optical amplifiers. Use of Bragg gratings for switching and dispersion compensation. Design and operation of current systems including those using dense wavelength division multiplexing.
Credit Points:12
Class Contact:36 hours lectures/tutorials.
Required Reading: Jones, W.B. 1988, Introduction to Optical Fiber Communication Systems, Holt Rinehart and Winston, New York.
Assessment: Four assignments (each assignment report not exceeding 5000 words) 10% each. Final examination (Two Hours) 60%.

VPP6521 OPTICS AND LASERS

Locations: Footscray Park.
Prerequisites: Nil.
Description: Interaction of radiation with matter; absorption, spontaneous emission and stimulated emission. Population inversion, net gain. Introductory ideas of optical cavities, threshold. Time behaviour of laser output, burst-mode and Q-switched pulses. General requirements for CW output. Rate equations. Overview of laser materials and pumping methods. Examples of gas, solid state and semiconductor lasers. Laser Oscillators. Line broadening mechanisms, inhomogeneous and homogeneous broadening, gain saturation. Laser output versus input. Laser amplifiers. Optical resonators. Short pulse techniques. Tunable laser techniques. Non-linear optics - second harmonic generation and parametric oscillation. Laser applications. Laser safety and laser hazards. Fibre lasers and optical amplifiers.
Credit Points:12
Class Contact:36 hours lectures/tutorials/laboratories.
Required Reading: Verdeyen, J.T. 1995, Laser Electronics, 3rd edn, Prentice-Hall International, USA.
Assessment: Two assignments (each assignment report not exceeding 5000 words) 10% each. Two laboratory reports (word length of each not exceeding 2500 words) 10% each; Final examination (Two Hours) 60%.

VPP6522 DIGITAL COMMUNICATIONS OVER OPTICAL NETWORKS

Locations: Footscray Park.
Prerequisites:VPP6511 - FIBRE OPTIC COMMUNICATION SYSTEMS
Description: Fibre Optic transmission systems. Issues of chromatic dispersion, fibres and operational wavelengths, sources and receivers. LANs, Gigabit and 10 gigabit Ethernet, WANs, MANs, power budget. Protocols for modern communication systems - SONET/SDH: Architecture and protocols, speeds, architecture layers, network elements, rings, switching, restoration, and diversity. WDM and DWDM: special fibres, erbium-doped fibre amplifier (EDFA), tunable laser diode at 1550 nm. Practical issues in Optical Networking, non linearities, Raman amplifiers. Future trends.
Credit Points:12
Class Contact:36 hours lectures/tutorials/laboratories exercises.

Required Reading: Goralski, W. 2001, Optical Networking & WDM, SPIE, Bellingham WA
Assessment: Two assignments (each assignment report not exceeding 5000 words) 10% each. Two laboratory reports (word length of each not exceeding 2500 words) 10% each; Final examination (Two Hours) 60%.

VPP6531 QUANTUM OPTICS

Locations: Footscray Park.
Prerequisites: Nil.
Description: Photoelectric effect and spontaneous emission. de Broglie Waves: wave-particle duality, Heisenberg's Uncertainty Principle, properties of matter waves. Schroedinger Wave Equation: wave functions, expectation values, eigenfunctions, zero potential, potential steps and barriers, tunnelling, particle in a box, simple harmonic oscillator. One electron atoms: eigenfunctions and eigenvalues, probability densities, orbital angular momentum, electron spin, orbital and spin magnetic dipole moments, spin-orbit interaction, total angular momentum. Multielectron atoms and the Periodic Table of the Elements. The interaction of radiation with matter including angular momentum and selection rules. Spectroscopy of optical materials.
Credit Points: 12
Class Contact: 36 hours lectures/tutorials/laboratories exercises.
Required Reading: Taylor, J.R., Zafiratos, C.D. and Dubson, M.A. 2003, Modern Physics for Scientists and Engineers, 2nd edn, Prentice Hall, NJ.
Assessment: Two assignments (each assignment report not exceeding 5000 words) 10% each. Two laboratory reports (word length of each not exceeding 2500 words) 10% each; Final examination (Two Hours) 60%.

VPP6532 OPTICAL FIBRE SENSORS

Locations: Footscray Park.
Prerequisites: VPP6511 FIBRE OPTIC COMMUNICATION SYSTEMS
Description: Introduction and basic concepts, materials interactions in optical fibre sensors, fibre optic components, special optical fibres for sensors, interferometric sensors, fibre-optic gyroscope, intensity and wavelength-based sensors, multiplexed and distributed sensors. Fibre Bragg gratings for strain or temperature measurement. Applications of fibre sensors, e.g. smart structures.
Credit Points: 12
Class Contact: 36 hours lectures/tutorials/laboratories exercises.
Required Reading: Grattan, K.T.V. and Meggitt, B.T. 1995-1999, Optical Fiber Sensor Technology Volumes 1-4, Chapman & Hall, London and Kluwer Academic, Dordrecht, Netherlands.
Assessment: Two assignments (each assignment report not exceeding 5000 words) 10% each. Two laboratory reports (word length of each not exceeding 2500 words) 10% each; Final examination (Two Hours), 60%.

VPP6541 OPTICAL MATERIALS

Locations: Footscray Park.
Prerequisites: Nil.
Description: General Properties. Propagation of E/M waves in dielectric media; models of the refractive index; dispersion, absorption and the refractive index; frequency dependence; scattering; cross-sections. Properties of Lens Materials Commonly used materials in the ultra-violet, visible and infrared regions; transmittance, dispersion and the refractive index; environmental properties; examples. Solid State Laser Materials Host materials: crystalline materials, semiconductors, active ions; colour centres. Non-linear Materials Electro-optic effect; magneto-optic effect. Thin Film Materials Substrates. Optical damage mechanisms; self-focusing; damage thresholds; specification of cosmetic surface quality of optical components.
Credit Points: 12
Class Contact: 36 hours lectures/tutorials.
Required Reading: Pedrotti, F.L. and Pedrotti L.S. 1993. Introduction to Optics, 2nd edn, Prentice Hall, NJ
Assessment: Four assignments (each assignment report not exceeding 5000 words) 10% each.Final examination (Two Hours) 60%.

VPP6542 DATA ACQUISITION

Locations: Footscray Park.
Prerequisites: Nil.
Description: In this subject, students will learn advanced features of modern data acquisition and computer interfacing software, such as LabView. Students will be assigned projects that will involve the automation of an experiment, both in terms of the hardware and software requirements.
Credit Points: 12
Class Contact: 36 hours including 24 hours of laboratory classes, 12 hours of lectures/tutorials.
Required Reading: Essick, C., 1998, Advanced Labview Labs, Prentice-Hall NJ.
Assessment: Two assignments (each assignment report not exceeding 5000 words) 10% each. Laboratory project (report not exceeding 10,000 words) 80%.

VPP8001 RESEARCH THESIS 1 FULL TIME

Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points: 48

VPP8002 RESEARCH THESIS 2 FULL TIME

Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points: 48

VPP8011 RESEARCH THESIS 1 PART TIME

Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate

Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:24

VPP8012 RESEARCH THESIS 2 PART TIME
Prerequisites: Nil.
Credit Points:24

VPP8050 PROJECT MANAGEMENT SPECIFIC TOPIC (PROJECT WORK - 12CP)
Locations: Footscray Park.
Prerequisites:VPP5630 Research Methods or concurrently with it.
Description: The unit of study (UoS) enables students to: identify a project problem and critically review relevant literature; determine appropriate methods to study the problem; collect, and analyse data, and generate results using suitable statistical and analytical techniques; draw conclusions, critically evaluate the process undertaken and make recommendations for future research and for practice; present the results of the project undertaken, both clearly and accurately in a written report. The report topic chosen will allow the candidate to develop a methodology and to apply it to an appropriate problem or situation. The report will normally be from 8000 to 15,000 words. It will detail the problem, relevant literature, analysis conducted, conclusions and recommendations. Students will be supervised by an academic member of staff and where appropriate by a supervisor from another institution or from industry.
Credit Points:12
Learning Outcomes: Students will be able to define and solve problems and issues related to industry. Be capable of analysing and finding appropriate solutions to problems using analytical and statistical techniques.
Class Contact:A three-hour briefing is given to students at the start of the UoS. Three hours per week for two semesters.
Required Reading: Formal class notes will be provided to students for each UoS. These notes are reviewed and updated regularly.
Assessment: Assessment will be by project work and report.

VPP8060 PROJECT MANAGEMENT SPECIFIC TOPIC (PROJECT WORK - 24CP)
Locations: Footscray Park.
Prerequisites:VPP5630 Research Methods or concurrently with it.
Description: The unit of study (UoS) enables students to: identify a project problem and critically review relevant literature; determine appropriate methods to study the problem; collect, and analyse data, and generate results using suitable statistical and analytical techniques; draw conclusions, critically evaluate the process undertaken and make recommendations for future research and for practice; present the results of the project undertaken, both clearly and accurately in a written report. The report topic chosen will allow the candidate to develop a methodology and to apply it to an appropriate problem or situation. The report will normally be from 8000 to 15,000 words. It will detail the problem, relevant literature, analysis conducted, conclusions and recommendations. Students will be supervised by an academic member of staff and where appropriate by a supervisor from another institution or from industry.
Credit Points:24
Learning Outcomes: Students will be able to define and solve problems and issues related to industry. Be capable of analysing and finding appropriate solutions to problems using analytical and statistical techniques.
Class Contact:A three-hour briefing is given to students at the start of the UoS. Six hours per week for one semester.
Required Reading: Formal class notes will be provided to students for each UoS. These notes are reviewed and updated regularly.
Assessment: Assessment will be by project work and report.

VPT8001 RESEARCH THESIS 1 FULL TIME
Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:48

VPT8002 RESEARCH THESIS 2 FULL TIME
Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:48

VPT8011 RESEARCH THESIS 1 PART TIME
Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:24

VPT8012 RESEARCH THESIS 2 PART TIME
Prerequisites: Nil.
Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link:
http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link:
http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/
Credit Points:24

VQB5611 RISK ASSESSMENT AND HUMAN BEHAVIOUR

Locations: Werribee.

Prerequisites: Nil.

Description: The unit introduces students to basic fire safety engineering design concepts and provides students with the necessary knowledge concerning occupant communication and response submodels and subsystems as a basis for assessing the necessary input data for a risk assessment model. An introduction to Building Code of Australia (BCA) and Fire Engineering Guidelines is provided. Important aspects of human behaviour during fire will also be introduced. Many assumptions generally held about the way humans respond to fire emergencies have been shaped by the media and provide a sensationalised view. In this unit, we will seek to clarify this view by presenting research to uncover what can truly be expected from people when a fire occurs. Statistics from coronial data will also be examined to provide an overview of who is at most risk when a fire starts. The focus will be on urban and residential structure fires, but human behaviour during bushfires will also be discussed. Other areas covered in this unit are: Fire statistics and statistical analysis of occurrence, death and injuries; Introduction to risk management including probability, reliability, fault trees, event trees. The initiation and development of fires, fire characterisation and design fires.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to :

- Apply basic concepts and alternative acceptable frameworks for performance-based codes, with an emphasis to fire safety engineering design.
- Utilize basic concepts of risk management and probabilistic risk assessment.
- Develop simple fault tree and event tree.
- Interpret and analyse fire statistical data of various sorts.
- Evaluate the occupant communication and response in relation to fire cues.
- Interpret physiological and psychological effects of fire, and construct tenability criteria for the life safety.

Class Contact: Over a one week period, there will be 28 hours of face- to- face learning. Students are also expected to complete an equivalent amount of structured self directed studies.

Required Reading: Australian Building Codes Board, 2011, 2011 edn, Building code of Australia, Australian Building Codes Board. Australian Building Codes Board, 2005, 2005 edn, International fire engineering guidelines, Australian Building Codes Board. In addition, a very comprehensive set of course notes will be available that cover most topics. These course notes will contain further references and reading material.

Assessment: There will be a Report and 2 Assignments and the content of this unit will be a part of the examination that will be conducted as part of VQB5642 assessment. Report, Word limit 2500 words, 50%. Assignment, Assignment 1 - Word limit 1300 words, 25%. Assignment, Assignment 2 - Word limit 1300 words, 25%. Report covers Learning Outcomes 5 & 6 and all three Graduate Capabilities Assignment 1 covers Learning Outcomes 1 & 2 and Graduate Capabilities 1 & 3 Assignment 2 covers Learning Outcomes 3 & 4 and Graduate Capabilities 1 & 3 .

VQB5612 SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALS

Locations: Werribee.

Prerequisites: Nil.

Description: The unit provides students with basic information on scientific principles for fire professionals such as combustion, products of combustion (heat and smoke), heat and mass transfer, response of structural elements to heat, visibility through smoke and smoke toxicity. The unit will cover basic chemical reactions and the fire triangle, ignition of solid and liquid fuels, combustion, fire plumes and fire behaviour of building contents and lining materials. The unit will also provide an introduction to pre and post flashover enclosure fires and mathematical modelling of enclosure fires (zone and field models).

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Integrate an understanding of the basic chemical reactions and the fire triangle, with the ignition of solid and liquid fuels, combustion, and products of combustion (heat and smoke).
- Recognise fire properties of various materials and fire behaviour of building contents and lining materials.
- Interpret basic theories of heat transfer, fluid dynamics and fire dynamics.
- Evaluate visibility through smoke and smoke toxicity.
- Infer basic concepts how structural elements are affected during fire.
- Recognise capabilities and limitations of a number of commonly used assessment tools.

Class Contact: Over a one week period, there will be 24 hours of face to face learning and 4 hours of laboratory demonstration. In addition students are expected to complete an additional 24 hours of structured self directed studies.

Required Reading: Drysdale, D 2011, 3rd edn, An introduction to fire dynamics, John Wiley and Sons, London. Holman, JP 2010, 10th edn, Heat transfer, McGraw Hill Higher Education, Boston. In addition, a very comprehensive set of course notes will be available that cover most topics. These course notes will contain further references and reading material.

Assessment: There will be 3 Assignments and content of this unit will be a part of the examination that will be conducted as part of VQB5642 assessment. Assignment, Assignment 1 - Word limit 1300, 25%. Assignment, Assignment 2 - Word limit 2500, 50%. Assignment, Assignment 3 - Word limit 1300, 25%. Assignment 1 covers Learning Outcome 1 and all three Graduate Capabilities Assignment 2 covers Learning Outcomes 3,4 & 5 and all three Graduate Capabilities Assignment 3 covers Learning Outcomes 2 & 6 and all three Graduate Capabilities .

VQB5621 FIRE GROWTH, DETECTION AND EXTINGUISHMENT

Locations: Werribee.

Prerequisites: Nil

Description: The subject provides students with basic information on fire technology and explains the initiation and development of fires including an understanding and facility in the application of the range of detection systems and of manual and automatic extinguishing subsystems in terms of: mechanism of extinguishment; detection performance; component modelling; response time assessment; reliability criteria, redundancy and the effect of maintenance; performance testing. The subject covers the combustion process and the fire triangle. Heat transfer mechanism, combustion of gases and vapours and fire plumes. Combustion of liquids and solids, fire toxicity and products of combustion. Fire behaviour of materials and products and fire retardants, fire test methods. Fire initiation and development. Pre and Post flashover enclosure fires. Mathematical modelling of enclosure fires (zone and field models). Management of fire initiation and development and implications to performance design. Detection and extinguishment, principles of detection and alarm. Fire detection and alarm systems, water based extinguishment. Fire engineering design for extinguishment, system reliability. Fire brigade response and operations.

Credit Points:12

Required Reading:A very comprehensive set of course notes is provided for each subject and topic; these contain further references and reading material. Building Code of Australia, 2004, Australian Building Codes Board. Australian Building Codes Board, 2001, Fire Safety Engineering Guidelines. DiNenno P.J. (ed.) 2002, The SFPE Handbook of Fire Protection Engineering, Third edn, National Fire Protection Association, USA. Warren Centre (University of Sydney), 1989, Fire Safety and Engineering Project Report. Standards Australia, 1995, AS 2118, Automatic Fire Sprinkler Systems, parts 1-12. Drysdale, D., 1999, An Introduction to Fire Dynamics, 2nd edn, John Wiley and Sons, London.

VQB5632 SMOKE AND FIRE SPREAD, FIRE SAFETY SYSTEM DESIGN

Locations: Werribee.

Prerequisites:VQB5621 - FIRE GROWTH, DETECTION AND EXTINGUISHMENTNil

Description: The unit provides students with an understanding of fire safety systems design principles and interaction between various submodels as described in fire engineering guidelines. It covers developing fire scenarios (qulalitatively and quantitatively) based on ignition probability, availability and effectiveness of suppression system and compartmentation and structural adequacy. It also covers basics of spread of smoke and fire in buildings, buoyancy of smoke, principles of smoke hazard management, structural performance in fire, detection and extinguishment and principles of evacuation.   The unit will include an application of the Fire Brigade Intervention Model (FBIM) to fire situations, and emphasizes knowledge about the capabilities of fire brigade equipment including trucks, water pumps, scaffolding, and hoses. Students will be given hands-on-experience of operating the equipment during a field visit to the Metropolitan Fire and Emergency Services Board.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to: Recognise the interaction between various submodels described in the Fire Engineering Guidelines. Infer the underlying basic physics of some assessment tools and when to refer designs to a more appropriately qualified assessor. Evaluate various fire safety system options and analyse how these systems affect building fire safety. Appraise the role and capabilities of fire brigade.

Class Contact: Over a one week period, there will be 22 hours of face to face learning. Students are also expected to complete an additional 22 hours of structured self directed studies.   In addition there will be a field visit.

Required Reading: Australian Building Codes Board 2012, 2012 edn, Building code of Australia 2012, Australian Building Codes Board. Australian Building Codes Board 2005, 2005 edn, International fire engineering guidelines, Australian Building Codes Board. Drysdale, D 2011, 3rd edn, An introduction to fire dynamics John Wiley and Sons, London. Australian Fire and Emergency Services Authorities Council, Fire brigade intervention education (CD Version), Australian Fire and Emergency Services Authorities Council. In addition, a very comprehensive set of course notes will be available that cover most topics. These course notes will contain further references and reading material.

Assessment: There will be 3 assignments. Assignment, Assignment 1 - word limit 1800, 35%. Assignment, Assignment 2 - word limit 2500, 50%. Assignment, Assignment 2 - word limit 1000, 15%. Assignment 1 covers Learning Outcomes 1 & 3 and Graduate Capabilities 1 & 2 Assignment 2 covers Learning Outcomes 1, 2 & 3 and Graduate Capabilities 1 & 2 Assignment 3 covers Learning Outcomes 4 and Graduate Capability 3 and LiWC .

VQB5641 FIRE SAFETY SYSTEMS DESIGN

Locations: Werribee.

Prerequisites:VQB5612 - SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALS

Description: The unit provides students with an understanding of fire safety systems design principles and interaction between various submodels as described in fire engineering guidelines. It covers developing fire scenarios and design fires based on ignition probability, availability and effectiveness of suppression system and compartmentation and structural adequacy. It also covers basics of spread of smoke and fire in buildings, buoyancy of smoke, principles of smoke hazard management, structural performance in fire, detection and extinguishment and principles of evacuation.   The unit will include an application of the Fire Brigade Intervention Model (FBIM) to fire situations, and emphasizes knowledge about the capabilities of fire brigade equipment including trucks, water pumps, scaffolding, and hoses. Students will be given hands-on-experience of operating the equipment during a field visit to the Metropolitan Fire and Emergency Services Board.

Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Recognise the interaction between various submodels described in the Fire Engineering Guidelines.
- Infer the underlying basic physics of some assessment tools and when to refer designs to a more appropriately qualified assessor.
- Evaluate various fire safety system options and analyse how these systems affect building fire safety.
- Appraise the role and capabilities of fire brigade.
- Recognise the importance of occupational health and safety issues related to fire fighting and rescue operation.

Class Contact: Over a one week period, there will be 22 hours of face to face learning. Students are also expected to complete an additional 22 hours of structured self directed studies.   In addition there will be a field visit.

Required Reading: Australian Building Codes Board 2011, 2011 edn, Building code of Australia 2011, Australian Building Codes Board. Australian Building Codes Board 2005, 2005 edn, International fire engineering guidelines, Australian Building Codes Board. Drysdale, D 2011, 3rd edn, An introduction to fire dynamics John Wiley and Sons, London. Australian Fire and Emergency Services Authorities Council, Fire brigade intervention education (CD Version) Australian Fire and Emergency Services Authorities Council. In addition, a very comprehensive set of course notes will be available that cover most topics. These course notes will contain further references and reading material.

Assessment: There will be 3 assignments and content of this unit will be a part of the examination that will be conducted as part of VQB5642 assessment. Assignment, Assignment 1 - word limit 1500, 30%. Assignment, Assignment 2 - word limit 2200, 45%. Assignment, Assignment 3 - word limit 1300 (LiWC), 25%. Assignment 1 covers Learning Outcomes 1 & 3 and Graduate Capabilities 1 & 2 Assignment 2 covers Learning Outcomes 1, 2 & 3 and Graduate Capabilities 1 & 2 Assignment 3 covers Learning Outcomes 4 & 5 and Graduate Capability 3 and LiWC .

VQB5642 PERFORMANCE CODES METHODOLOGY AND STRUCTURE

Locations: Werribee.

Prerequisites: VQB5641 - FIRE SAFETY SYSTEMS DESIGN

Description: The unit introduces the student to the principles, methodology and scope of performance based building codes in light of Building Code of Australia, Australian Standards and State legislation (technical and administrative framework) and provides the student with an understanding of the structure of performance design and approval. The unit will also cover estimation of acceptance criteria based on performance requirements, introduction to quantitative risk assessment and expected risk to life (ERL) and fire cost expectation (FCE). The unit introduces to legal issues, documentation, joint and several kinds of tortfeasor liability. An introduction to Bushfire Regulations will also be covered in addition to thorough life performance and maintenance of fire safety equipment; quality assurance and the building permit/inspection process. In this unit students will have the opportunity to critically analyse a fire engineering report in reference to the above codes.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Apply the principles, methodology and scope of performance-based building codes.
- Execute the approval process in relation to the structure of performance design.
- Interpret the legal, statutory and design integrity requirements.
- Critically assess a performance-based fire safety solution document and/or recognise when to refer designs onto a more appropriately qualified assessor.
- Recognise the need for a compliance of the design assumptions throughout the operational life of the building.

Class Contact: Over a one week period, there will be 28 hours of face- to- face learning and students are expected to complete an equivalent amount of structured self directed studies.

Required Reading: Australian Building Codes Board 2011, 2011 edn, Building code of Australia, Australian Building Codes Board. Australian Building Codes Board 2005, 2005 edn, International fire engineering guidelines, Australian Building Codes Board. Drysdale, D 2011, 3rd edn, An introduction to fire dynamics, John Wiley and Sons, London. In addition, a very comprehensive set of course notes will be available for most topics. These course notes will contain further references and reading material.

Assessment: There will be 2 assignments and 1 three-hour examination. The examination will cover contents from VQB5611, VQB5612 and VQB5641. Assignment, Assignment 1 - word limit 800, 15%. Assignment, Assignment 2 - word limit 1600, 35%. Examination, 3 hours (Hurdle requirement), 50%. The final written examination is an open book test where the students will critically analyse a fire engineering design brief or report. To pass this unit a student must achieve a cumulative pass for the 2 Assignments and obtain a pass in the examination. Assignment 1 covers Learning Outcomes 1 & 2 and Graduate Capabilities 1 & 2 Assignment 2 covers Learning Outcomes 1, 2,3, & 5 and Graduate Capabilities 2, 3 & 4 Examination covers all five Learning Outcomes and the Learning Outcomes of VQB5611, VQB5612 & VQB5641 and all four Graduate Capabilities and the Graduate Capabilities of VQB5611, VQB5612 and VQB5641.

VQB5751 FIRE TECHNOLOGY MODELLING

Locations: Werribee.

Prerequisites: VQB5612 - SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALSVQB5641 - FIRE SAFETY SYSTEMS DESIGN

Description: The unit provides students with an understanding on the details of combustion process, flame characteristics, fire behaviour of materials, fire retardants and various test methods. It also covers, modelling of decomposition and combustion of fuels in various forms and associated heat transfer mechanisms during pre and post flashover stages. Details of two-zone models and computational fluid dynamics models (including underlying physics and numerical scheme); and model validation are an integral part of this unit.

Credit Points: 12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Integrate an advanced understanding of chemical decomposition, with the pyrolysis of solid and evaporation of liquid fuels, combustion, and modelling of these reactions
- Identify fire properties of various materials, fire behaviour of building contents, lining materials and fire retardant products, and various test methods
- Explain advanced heat transfer, fluid dynamics and fire dynamics theories
- Use a number of commonly used assessment tools for fire and smoke growth and propagation.

Class Contact: There will be one week long session for this unit. Within this week the following will be conducted: Lectures 30 hours (Fifteen 2 hourly lectures in a designated week) Laboratory demonstration 2 hours (one 2 hourly session in the above week) Students are also expected to complete an equivalent amount of structured self directed studies.

Required Reading: Drysdale, D., 2010 3rd An Introduction to Fire Dynamics John Wiley and Sons, London Australian Building Codes Board, 2005 2005 International Fire Engineering Guidelines Australian Building Codes Board

Assessment: Assignment, Assignment -1 (1300 words), 25%. Assignment, Assignment -2 (1800 words), 35%. Assignment, Assignment -3 (1000 words), 20%. Report, Report (1000 words), 20%. Assignment 1 covers Learning Outcomes 1 and 2 and Graduate Capabilities 2 and 3 Assignment 2 covers Learning Outcome 3 and Graduate Capabilities 1 and 2 Assignment 3 covers Learning Outcome 4 and Graduate Capabilities 1 Report covers Learning Outcome 4 and Graduate Capabilities 1 and 3.

VQB5761 FIRE SAFETY SYSTEMS MODELLING

Locations: Werribee.

Prerequisites: VQB5612 - SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALSVQB5641 - FIRE SAFETY SYSTEMS DESIGN

Description: The unit provides students with an understanding on the details of development of design fires with their likelihood of occurrence and modelling of active and passive building fire safety subsystems as well as the evacuation time. This will include detection and sprinkler operation predictions; suppression models and modelling of structure failure in various design fires. Smoke and flame spread and their management options, performance based detection and suppression

system design and a fire brigade intervention model are also covered in the unit.
Credit Points:12

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- Develop possible fire scenarios and associated design fire with likelihood of occurrence.
- Evaluate smoke hazards and appropriately use fire safety system options to reduce the risks
- Model active and passive fire safety systems, their interaction among themselves and with fire
- Model occupant evacuation during an emergency
- Use fire brigade intervention model.

Class Contact: There will be one week long session for this unit. Within this week, 30 of hours lecture (2 hours lecture x 15) will be delivered. Students are also expected to complete an equivalent amount of structured self directed studies.
Required Reading: Australian Building Codes Board, 2005 2005 International Fire Engineering Guidelines Australian Building Codes Board Drysdale, D., 2010 3rd An Introduction to Fire Dynamics John Wiley and Sons, London
Assessment: Report, Report (1500 words), 30%. Assignment, Assignment -1 (1300 words), 25%. Assignment, Assignment -2 (1000 words), 20%. Assignment, Assignment- 3 (1300 words), 25%. Report covers Learning Outcomes 1 and 3 and Graduate Capabilities 1 and 3 Assignment 1 covers Learning Outcome 2 and Graduate Capabilities 1 and 2 Assignment 2 covers Learning Outcomes 1 and 3 and Graduate Capabilities 1 and 2 Assignment 3 covers Learning Outcomes 4 and 5 and Graduate Capabilities 1 and 2.

VQB5771 FIRE SAFETY ENGINEERING APPLICATION

Locations: Werribee.
Prerequisites:VQB5611 - RISK ASSESSMENT AND HUMAN BEHAVIOURVQB5642 - PERFORMANCE CODES METHODOLOGY AND STRUCTUREVQB5751 - FIRE TECHNOLOGY MODELLINGVQB5761 - FIRE SAFETY SYSTEMS MODELLING
Description: This 24 credit point unit serves as a capstone unit in which students will have the opportunity to integrate technical knowledge and skills from previous units and apply them in realistic work-related settings. The first part of this unit provides students with an understanding on the details of various approaches used for the analysis, design and management of fire safety systems in buildings, with particular emphasis placed on an absolute quantitative approach. This approach uses a probabilistic risk assessment methodology based on historical data to assess the expected risk to life (ERL), safety and the expected costs (and their benefits) to develop a performance based building design. The students will be introduced to fire investigation processes and project management techniques. In the second part of the unit Students will work in project teams to design and develop a Fire Safety System for a building project in the student's own workplace or that of a fellow student. In this project students will be required to employ quantitative and qualitative assessment techniques, performance based building designs, and demonstrate compliance with BCA standards. They will need to factor in fire insurance implications and general environmental, social and economic impacts. This approach of Learning in the Workplace and Community (LiWC) is aimed at enabling students undertake a real world project which affords them avenues to engage directly with industry, while simultaneously advancing both their technical and generic skills.
Credit Points:24

Learning Outcomes: On successful completion of this unit students are expected to be able to:

- work independently to conduct probabilistic risk assessment of a real or simulated system.
- as a member of a project team identify and analyse the BCA performance requirements and fire safety issues of a building and develop approaches to address them and formally present to peers and industry representatives.
- as a member of a project team develop a framework for a fire engineering assessment including: trial concept design, methods of assessment/analysis, acceptance criteria, hazards, and occupant and building characteristics, taking into consideration environmental, social and economic impacts calling on national and international best practices and present in a formal report.
- as a member of a project team undertake a quantitative and /or qualitative analysis of a range of real world concept designs, select the best with an accompanying rationale that complies with the BCA Performance Requirements and develop a strategy for implementation and present in a formal report and/or a poster.
- reflect upon and evaluate own performance as an individual learner as well as a project team member in the context of own continuing professional development strategy and career goals.

Class Contact: There will be two week long session for this unit. Within these weeks, 20 hours of lectures (2 hours lecture x 10) will be delivered. Another 40 hours will be used for formative and summative presentations, tutorials and consultations. Students are also expected to complete an equivalent amount of structured self directed studies.
Required Reading: Australian Building Codes Board, 2011 2012 Edition Building Code of Australia Australian Building Codes Board, Australian Building Codes Board, 2005 2005 Edition International Fire Engineering Guidelines Australian Building Codes Board, DiNenno P. J.(ed) 2008 4th Edition SFPE Handbook of Fire Protection Engineering National Fire Protection Association
Assessment: Assessment will be on the basis of presentations, poster and progressive submission a number of assignments/ reports at various stages. Suggested allocation of marks (in %) are given below. It is to be noted that as it is a 24 Credit Point the total assessment will be conducted out of 200 marks i.e. the allocation below will be doubled in absolute figures. Assignment, Assignment word Limit 1,000 words (individual work), 10%. Presentation, Summative Presentation 1 - 15 minutes (teamwork), 5%. Report, Report 1 (Preliminary) - 3,000 words (teamwork), 10%. Report, Report 2 (Fire Engineering Brief)- 7,500 words (teamwork), 25%. Presentation, Summative Presentation 2 (Fire Engineering Brief) - 30 minutes (teamwork), 10%. Report, Report 3 (Fire Engineering Report) - 10,000 words (teamwork), 35%. Poster, Poster (Fire Engineering Report), 5%. Summative presentations and poster will be given to the rest of the class and where possible to the industry representatives. This will assist the students to learn from each other and engage with industry through questions and answers. Assignment covers Learning Outcomes 1 and Graduate Capabilities 1 and 4. Summative Presentation covers Learning Outcome 2 and Graduate Capabilities 2 and 3 and LiWC. Report 1 covers Learning Outcomes 2 and Graduate Capabilities 1, 2, 3 and 4 and LiWC. Report 2 covers Learning Outcomes 3 and all Graduate Capabilities 1, 2, 3, 4, 5, Internationalisation and LiWC. Summative Presentation 2 covers Learning Outcomes 2 and 3 and Graduate Capabilities 1, 2, 3, 4, 5, Internationalisation and LiWC.

Report 3 covers Learning Outcomes 3 and 4 and all Graduate Capabilities, Internationalisation and LiWC Poster covers Learning Outcomes 3, 4 and 5 and all Graduate Capabilities, Internationalisation and LiWC. This may include an individual interview. .

VQB5772 FIRE SAFETY SYSTEM DESIGN

Locations: Werribee.

Prerequisites: Fire Safety System Design: VQB5751, VQB5761 and VQB5642.

Description: The subject provides a description of various approaches used for the design of the safety in buildings, with particular emphasis placed on a fire safety system (FSS) performance model. The FSS model uses a risk assessment methodology to assess the risk to life safety and the expected losses, and to incorporate this risk assessment as part of the design procedure for the fire safety in buildings.introduction, alternative design approaches, fire engineering design code framework, risk assessment methodology, and description of a fire safety system (FSS) model and its parameters; risk to life submodel and economic submodel. Description of the various submodels comprising the FSS model-namely: fire initiation and growth submodel, smoke spread submodel, fire spread submodel, occupant communication and avoidance submodel, fire brigade submodel. In-service performance. Application of fire safety system models.

Credit Points:12

Class Contact: Three hours of lectures per week for one semester.

Required Reading:A very comprehensive set of course notes is provided for each subject and topic; these contain further references and reading material. DiNenno, P.J. (ed.) 2002, The SFPE Handbook of Fire Protection Engineering, Third edn, National Fire Protection Association, USA. Draft National Building Fire Safety Systems Code, commissioned by the Building Regulations Review Task Force 1989, Fire Engineering Guidelines, Fire Code Reform Centre, March 1995, Fire Safety and Engineering, Technical Papers Books 1 and 2, The Warren Centre for Advanced Engineering, University of Sydney. Working Party on Fire Engineering. Guidelines for Chemical Process Quantitative Risk Analysis, prepared for Centre for Chemical Process Safety of the American Institute of Chemical Engineers, New York, 1989.

Assessment: Assessment will be made on the basis of assignments. Four assignments, each 25%. Supplementary assessment will not be available.

VQB5773 INDUSTRIAL EXPERIENCE ON FIRE SAFETY

Locations: Werribee.

Prerequisites: Nil.

Description: This unit of study will serve as an industrial experience unit for the course in which students will undertake a substantial LiWC (Learning in Workplace and Community) experience for their employer or selected organization. Students will be asked to take part in a project agreed to by their workplace supervisor and Victoria University (VU) coordinator. The project will provide students with the opportunity to gain experience of a real world situation and where possible apply their academic learning (the key principles covered in the course) to those situations.

Credit Points:24

Learning Outcomes: On successful completion of this unit students are expected to be able to: as a member of a project team identify and analyse the performance requirements given in their national building code and fire safety issues related to a building and develop approaches to address them gain experience of a real world situation relate the key principles covered in the course to a building project reflect upon technical skills that they have developed throughout the industrial experience and what they aspire to develop in the rest of the course.

Class Contact: Aggregate at least 6 weeks (@35 hours per week) i.e. 210 hours of industrial experience is required.

Required Reading: Australian Building Codes Board, 2005 2005 Edition International Fire Engineering Guidelines Australian Building Codes Board

Assessment: Report, Report (8000 words), 80%. Report, Reflection (2000 words), 20%. The report will be independently assessed by the workplace supervisor and VU coordinator. The reflection will be assessed by the VU coordinator. Report covers Learning Outcomes 1, 2, 3 and Graduate Capabilities 1, 2, 3, 4 and LiWC. Reflection covers Learning Outcomes 4 and Graduate Capabilities 5 and LiWC. .

VQB5781 MATHEMATICS FOR FIRE SAFETY ENGINEERS

Locations: Werribee.

Prerequisites:VQB5612 - SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALS

Description: Sound knowledge of mathematics is required for understanding the techniques and tools of analysis of fire safety designs. Core topics of this unit will include integration/ differentiation, vectors, matrices, linear equation, 1st and 2nd order linear differential equations and Taylor's series. Other topics will be chosen from numerical methods, vector calculus and partial differential equation.

Credit Points:12

Learning Outcomes: On completion of this unit students will be able to:

- Apply calculus method to problems in risk engineering;
- Use matrices to solve simultaneous linear equations;
- Apply first order and second order ordinary differential equations to problems in fire safety;
- Perform numerical integration and differentiation in the applied context;
- Perform numerical methods of differential equations representing engineering systems.

Class Contact: This unit will be conducted on-line over the summer semester (12 weeks period). There will be 3 hours per week on-line lectures over 12 weeks period. Students are also expected to complete an equivalent amount of structured self directed studies.

Required Reading: Kreyszig, E., 2010. 10th Edn, Advanced Engineering Mathematics John Willey & Sons, NY. Thomas, G. B., Weir, M. D., Hass, J. and Giordano, F. R., 2009. 12th Edn. Thomas' Calculus Addison-Wesley. DuChateau, P. and Zachmann, D. W., 2011. Schaum's Outline of Partial Differential Equations McGraw-Hill.

Assessment: Assignment, Assignment 1 (1500 words), 25%. Assignment, Assignment 2 (1500 words), 25%. Assignment, Assignment 3 (3000 words), 50%. Assignment 1 covers Learning Outcome 1 & 2 and Graduate Capabilities 1 & 2 Assignment 2 covers Learning Outcomes 3 & 4 and Graduate Capabilities 1 & 2 Assignment 3 covers Learning Outcomes 3, 4 & 5 and all three Graduate Capabilities. .

VQB5782 FIRE SPREAD AND FIRE SAFETY SYSTEM DESIGN PROJECT

Locations: Werribee.

Prerequisites:VQB5632 - SMOKE AND FIRE SPREAD, FIRE SAFETY SYSTEM DESIGN

Description: The first part of this subject provides an understanding of the mechanisms of and impediments to the spread of fire in buildings, and to provide a knowledge of the behaviour, analysis and design of the available subsystems for the management of fire spread.introduction and overview; reliability of smoke and fire management subsystems; mechanisms, timing and probability of fire spread; modelling fire spread; fire spread management subsystem; design of fire spread subsystem. In the second part of the subject Fire Safety System design project will apply knowledge gained during the course to the analysis and design of a cost-effective fire safety system for a proposed building project.

Credit Points:12

Class Contact: Three hours of lectures per week for one semester.

Required Reading:A very comprehensive set of course notes is provided for each subject and topic; these contain further references and reading material. DiNenno, P.J. (ed.) 2002, The SFPE Handbook of Fire Protection Engineering, Third edn, National Fire Protection Association, USA. Draft National Building Fire Safety Systems Code, commissioned by the Building Regulations Review Task Force 1989, Fire Engineering Guidelines Fire Code Reform Centre, March 1995, Fire Safety and Engineering, Technical Papers Books 1 and 2, The Warren Centre for Advanced Engineering, University of Sydney. Working Party of Fire Engineering Fire Engineering for Building Structures and Safety, The Institution of Engineers, Australia. Klote, J.H. and Milke, J.A. 1992, Design of Smoke Management Systems, American Society of Heating, Refrigerating and Air Conditioning Engineers Inc. and Society for Fire Protection Engineers, Atlanta, USA. Milke, J.A. and Klote, J.H., 1998, Smoke Management in Large Spaces in Building, Building Control Commission of Victoria and BHP Co Ltd, Melbourne.

Assessment: Assessment will be on the basis of submission of required assignments and a project. Assessment of the Fire Safety System Project will be on the basis of submission of a major report. Project submission, 70%; assignments, 30%. Supplementary assessment will not be available.

VQB5791 MECHANICS OF THERMO-FLUIDS AND SOLIDS FOR FIRE SAFETY ENGINEERS

Locations: Werribee.

Prerequisites:VQB5612 - SCIENTIFIC PRINCIPLES FOR FIRE PROFESSIONALS

Description: The unit provides students with a general understanding of fundamental and applied fluid dynamics, thermodynamics, combustion and mechanics of solids. Special emphasis is given to characterisation of fire dynamics and elucidation of structural behaviour (both elastic and inelastic) during a fire.

Credit Points:12

Learning Outcomes: On completion of this unit students will be able to:

- integrate a sound understanding of fluid mechanics, thermodynamics, combustion and solid mechanics theories
- develop and construct mathematical, physical and conceptual models of situations, systems and devices
- utilize the above models (learning outcome 2) for purposes of analysis and design and understand their applicability and shortcomings
- design experiments and identify appropriate measurements required.

Class Contact: This unit will be conducted on-line over the summer semester (12 weeks period). There will be 3 hours per week on-line lectures over 12 weeks period. Students are also expected to complete an equivalent amount of structured self directed studies.

Required Reading: Drysdale, D., 2010 3rd Edition, An Introduction to Fire Dynamics, John Wiley and Sons, London. Hibbler R.C., 2011 8th Edition, Structural Analysis, Pearson International. White, F. M., 2011 7th Edition, Fluid Mechanics, McGraw-Hill Series in Mechanical Engineering, New Jersey. Cengel, Y. A. and Boles, M. A., 2011 7th Edition, Thermodynamics- An Engineering Approach McGraw Hill, New York.

Assessment: Assignment, Assignment 1 (1500 words), 25%. Assignment, Assignment 2 (1500 words), 25%. Assignment, Assignment 3 (3000 words), 50%. Assignment 1 covers Learning Outcome 1 and Graduate Capabilities 1 & 2 Assignment 2 covers Learning Outcomes 1 and Graduate Capabilities 1 & 2 Assignment 3 covers Learning Outcomes 2, 3 & 4 and all three Graduate Capabilities .

VQT5790 INDUSTRIAL EXPERIENCE (FULL-TIME)

Locations: Werribee.

Prerequisites: Nil

Description: No formal content; students will be required to provide evidence of appropriate industrial experience in Australia, acceptable to the Head of the Centre.

Credit Points:48

Class Contact: No set contact hours, but a minimum of 32 hours per week of industrial experience is required for one semester.

Required Reading: Nil

Assessment: Evidence of appropriate industrial experience in the form of a letter from the employer detailing the experience.

VQT5791 INDUSTRIAL EXPERIENCE (PART-TIME)

Locations: Werribee.

Prerequisites: Nil

Description: No formal content; students will be required to provide evidence of appropriate industrial experience in Australia, acceptable to the Head of the Centre.

Credit Points:24

Class Contact: No set contact hours, but a minimum of 16 hours per week of industrial experience is required for two semesters.

Required Reading: Nil

Assessment: Evidence of appropriate industrial experience in the form of a letter from the employer detailing the experience.

VQT5792 INDUSTRIAL EXPERIENCE - PART TIME 2

Prerequisites: Nil.

Credit Points:24

VQT6050 BUILDING FIRE RESEARCH (FULL-TIME)

Locations: Werribee.

Prerequisites: Students are normally expected to have completed the Graduate Diploma in Building Fire Safety and Risk Engineering with an Honours average.

Description: The thesis will normally be from 15,000 to 25,000 words. It will report on independently conducted research which demonstrates the student's ability to clearly define a problem, to undertake a detailed literature search and review the literature on the topic area. The student shall, where appropriate, demonstrate both the ability to develop and/or apply models to study the problem together with appropriate data selection, collection and analysis. Students will normally be supervised by an academic member of staff and by a co-supervisor external to the Centre. The external supervisor will be an academic from the University or from another institution or a practitioner.

Credit Points:48

Class Contact: Regular contact will be made by arrangement with the supervisor.

Required Reading: To be advised by lecturer.

Assessment: Before commencing actual research, students must complete, to the satisfaction of the research supervisor, a paper critically reviewing the literature and providing a clear outline of the proposed research methodology and resources required to complete the thesis. The final thesis will be assessed by two examiners with expertise in the area of the research. These examiners may be internal or external to the Centre or the University and will not include the supervisors. Students may be asked to present themselves for oral or written examination by these examiners, at the examiner's discretion.

VQT6060 BUILDING FIRE RESEARCH (PART-TIME)

Locations: Werribee.

Prerequisites: Students are normally expected to have completed the Graduate Diploma in Building Fire Safety and Risk Engineering with an Honours average.

Description: The thesis will normally be from 15,000 to 25,000 words. It will report on independently conducted research which demonstrates the student's ability to clearly define a problem, to undertake a detailed literature search and review the literature on the topic area. The student shall, where appropriate, demonstrate both the ability to develop and/or apply models to study the problem together with appropriate data selection, collection and analysis. Students will normally be supervised by an academic member of staff and by a co-supervisor external to the Centre. The external supervisor will be an academic from the University or from another institution or a practitioner.

Credit Points:24

Class Contact: Regular contact will be made by arrangement with the supervisor.

Required Reading: To be advised by lecturer.

Assessment: Before commencing actual research, students must complete, to the satisfaction of the research supervisor, a paper critically reviewing the literature and providing a clear outline of the proposed research methodology and resources required to complete the thesis. The final thesis will be assessed by two examiners with expertise in the area of the research. These examiners may be internal or external to the Centre or the University and will not include the supervisors. Students may beasked to present themselves for oral or written examination by these examiners, at the examiner's discretion.

VQT6061 BUILDING FIRE RESEARCH A

Locations: Werribee.

Prerequisites: Students are normally expected to have a four-years degree in engineering or a three-years degree in science plus two years relevant work experience or have completed the Graduate Certificate in Performance-Based Building and Fire Codes with a distinction average.

Description: This unit provides students with opportunities for training in some key methodologies and research strategies for building fire research projects. Students have the opportunity to develop a range of skills in conceptualising and problematising research, to develop an understanding of various research tools and ability to plan an original research related to building fire safety. The project will be an engineering and/or scientific investigation of an approved topic developed through a detailed literature search and review of the literature on the approved topic area. Selection of appropriate research tools for the project, proposing various parameters to analyse and presenting the research proposal and methodology in an effective way are other key elements of this unit.

Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- clearly define a problem by undertaking a detailed literature search and review the literature on the topic/problem area.
- select appropriate research method and tools for a project;
- propose different ways of using/analysing data/ information for research;
- produce a review explaining research question and methodology including literature review.

Class Contact: The equivalent of 72 hours comprising discussion, self-directed studies and research work.

Required Reading: Texts and peer-reviewed literature related to the chosen topic.

Assessment: Assessment will be on the basis of approval of the supervisor to proceed to VQT6062. Review, Literature review and research proposal (the total effective word length is 5000 words)., Yes/No. The review covers all learning outcomes and graduate capabilities.

VQT6062 BUILDING FIRE RESEARCH B

Locations: Werribee.

Prerequisites:VQT6061 - BUILDING FIRE RESEARCH A

Description: This unit provides students with the opportunity to carry out an original research project related to building fire safety which is developed in VQT6061. Students will be expected to apply the knowledge and skills gained from the coursework component of the EMQB degree to this research project. In this unit the students are expected to conduct of analytical/ numerical/ experimental research and critical analysis, interpretation and presentation of results. The student shall, where appropriate, demonstrate both the ability to develop and/or apply models to study the problem together with appropriate data selection, collection and analysis. Students will normally be supervised by an academic member of staff.

Credit Points:24

Learning Outcomes: On successful completion of this unit, students are expected to be able to:

- adopt sound research methodologies and apply appropriate research tools in the investigations of building fire safety problems.
- objectively and critically analyse and discuss the results obtained.
- prepare a scientific research report in a format suitable for publication in a scientific journal.

Class Contact: The equivalent of 72 hours comprising discussion, self-directed studies and research work.

Required Reading: Texts and peer-reviewed literature related to the chosen topic.

Assessment: Assessment will be on the basis of examination of the research thesis. The thesis will be assessed by an examiner (other than the supervisor) with expertise in the area of the research. Thesis, Research Thesis (15,000-25,000 words), 100%. The Research Thesis covers all learning outcomes and graduate capabilities.

VQT8001 RESEARCH THESIS 1 FULL TIME

Prerequisites: Nil.

Description: Eligibility for entry to a Master of Science or Doctor of Philosophy program. This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points:48

VQT8002 RESEARCH THESIS 2 FULL TIME

Prerequisites: Nil.

Description: Eligibility for entry to a Master of Science or Doctor of Philosophy program. This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points: 48

VQT8011 RESEARCH THESIS 1 PART TIME

Prerequisites: Nil.

Description: Eligibility for entry to a Master of Science or Doctor of Philosophy program. This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points: 24

VQT8012 RESEARCH THESIS 2 PART TIME

Prerequisites: Nil.

Description: This unit of study is part of a research degree program. Information on research topics for the Faculty of Health, Engineering and Science may be found on the faculty website at the following link: http://www.vu.edu.au/Faculties/HealthEngineeringandScience/ResearchandResearchTraining/MajorResearchAreas/ Assessment criteria and Core Research Graduate Attributes can be found on the Office for Postgraduate Research website at the following link: http://www.vu.edu.au/Research/OfficeforPostgraduateResearch/PolicyProcessesandGuidelines/

Credit Points: 24

VU20904 PERFORM CUTTING, GRINDING AND TURNING OPERATIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to produce a range of basic engineering components and products by cutting, grinding and turning techniques. This involves identifying the required manufacturing methods, planning the operations, preparing materials and equipment, producing components and assembling components. The unit is intended to develop the basic skills and techniques attained through the pre-requisite machining, drawing interpretation, materials handling and OHS units. License to practice The skills and knowledge described in this unit do not require a licence to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships and traineeships.

Required Reading: Refer to Learning and Assessment Plan

Assessment: A person who demonstrates competency in this unit must be able to safely handle engineering materials. Competency in this unit cannot be claimed until all prerequisites have been satisfied. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and produce a range of basic engineering components and products by cutting, grinding and turning techniques use the required manufacturing methods plan operations and prepare materials and equipment.

VU20914 FORM, BEND AND SHAPE ENGINEERING MATERIALS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to produce a range of basic engineering components and products using basic fabrication techniques. This involves identifying the required manufacturing methods, planning the operations, preparing materials and equipment, producing components and assembling components. License to practice The skills and knowledge described in this unit do not require a licence to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships and traineeships, licensing, legislative.

Required Reading: Refer to Learning and Assessment Plan

Assessment: A person who demonstrates competency in this unit must be able to safely handle engineering materials. Competency in this unit cannot be claimed until all prerequisites have been satisfied. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and Demonstrate essential knowledge and associated skills as described in this unit; and Demonstrate an appropriate level of skills enabling employment

VU20915 PERFORM BASIC WELDING AND THERMAL CUTTING PROCESSES TO FABRICATE ENGINEERING STRUCTURES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to perform: basic welding using manual metal arc welding (MMAW) basic welding using gas metal arc welding (GMAW) basic thermal cutting using fuel gas equipment This involves identifying the welding/cutting requirements, preparing materials and equipment, welding and cutting components. Welding is routine and where the welding quality is not required to meet an Australian Standard or equivalent. Fillet and butt welds would typically be performed on low carbon/mild steels. Thermal cutting is manual straight line cutting. License to practice The skills and knowledge described in this unit do not require a licence to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships and traineeships.

Required Reading: Refer to Learning and Assessment Plan

Assessment:A person who demonstrates competency in this unit must be able to fabricate engineering structures using basic welding and thermal cutting processes. Competency in this unit cannot be claimed until all prerequisites have been satisfied. Assessors should gather a range of evidence that is valid, sufficient, current and authentic. Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. In particular this shall incorporate evidence that shows a candidate is able to: Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and Demonstrate essential knowledge and associated skills of this unit; and Demonstrate an appropriate level of skills enabling employment

VU21092 APPLY ADVANCED STATICS PRINCIPLES TO ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply advanced static concepts and principles to solve complex engineering problems. It includes two and three dimensional force analysis and associated diagrams for structures and mechanical componentry.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply advanced statics to solve engineering problems on more than one occasion and in different contexts involving two and/or three dimensional force analysis in structures and mechanical componentry.

VU21093 APPLY ADVANCED DYNAMICS PRINCIPLES TO ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply advanced dynamics to solve problems common to all engineering fields. This includes friction, centrifugal force, balancing, mechanical vibrations, impulse, momentum, impact, systems of bodies in motion, and simple, compound and epicyclic gearing.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply advanced dynamics to solve engineering problems on more than one occasion researching from the following areas respectively: - friction - centrifugal force. - balancing. - mechanical vibrations. - impulse, momentum and impact. - bodies in motion. - simple and compound gears. - epicyclic gears.

VU21094 APPLY FINITE ELEMENT ANALYSIS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply advanced dynamics to solve problems common to all engineering fields. This includes friction, centrifugal force, balancing, mechanical vibrations, impulse, momentum, impact, systems of bodies in motion, and simple, compound and epicyclic gearing.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and -Demonstrate the application of finite element analysis This includes: - modelling a wide range of shapes and structures; - choice of element type and control of element shape so as to minimise calculation errors; - effective use of library files; - selection of efficient modelling techniques including importation of geometry from other software packages; - application of appropriate boundary conditions; - verification of results; - presentation of results, including software generated graphics, in a form useful to others; - ability to identify areas of excessive stress and/or deformation and to recommend modifications.

VU21095 APPLY ELECTROTECHNOLOGY PRINCIPLES IN AN ENGINEERING WORK ENVIRONMENT

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to select, set-up and use a range of test equipment to measure voltage, current and resistance. This involves testing for continuity, insulation and identifying commonly used electrical/electronic devices for the supply of power and for the control of machines and plant in an engineering environment License to practice The skills and knowledge described in this unit do not require a licence to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships and traineeships.

Required Reading: Refer to Learning and Assessment Plan

Assessment: To be considered competent in this unit the participant must be able to demonstrate the achievement of all of the elements of competency to the level defined by their associated performance criteria and incorporating the required skills and knowledge. Specifically they must be able to: - Perform each element on at least two occasions - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement - Demonstrate application of the Required Skills and Knowledge at a level and within timeframes appropriate to the workplace.

VU21096 USE BASIC ENGINEERING CONCEPTS TO PLAN THE MANUFACTURE OF ENGINEERING COMPONENTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to plan the fabrication of engineering components. This involves defining the problem, identifying and reviewing specifications, determining resources, production sequence and schedules. License to practice The skills and knowledge described in this unit do not require a licence to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and, where applicable, contracts of training such as apprenticeships and the like.

Required Reading: Refer to Learning and Assessment Plan

Assessment: To be considered competent in this unit the participant must be able to demonstrate the achievement of all of the elements of competency to the level defined by their associated performance criteria and incorporating the required skills and knowledge. Specifically they must be able to: - perform each element on at least two occasions - implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement - demonstrate application of the Required Skills and Knowledge at a level and within timeframes appropriate to the workplace. - plan the routine manufacture of engineering components.

VU21098 APPLY MATHEMATICAL SOLUTIONS TO ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply mathematical concepts and methods that are common to all engineering fields. This includes arithmetic, algebra, geometry, equations, functions, graphs and the use of scientific calculators but does not include differential and integral calculus.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply mathematical concepts to engineering problems in new situations and different contexts.

VU21099 APPLY STATISTICAL METHODS FOR QUALITY CONTROL AND RELIABILITY

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply statistical concepts and methods that are common to all engineering fields for the purpose of quality control. This includes averages, probability, frequency distributions, standard deviation, and quality control applications.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Perform each element on at least two occasions - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement - Demonstrate application of the Required Skills and Knowledge at a level and within timeframes appropriate to the workplace. - Perform a range of statistical computation to obtain enumerated data on quality systems and reliability of outputs in different engineering contexts.

VU21100 APPLY PRINCIPLES OF MECHANICS TO ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply mechanics concepts and principles to solve problems common to all engineering fields. This includes forces, moments, friction and frames.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - apply principles of mechanics to solve engineering problems on at least two occasions researching from each of the following areas respectively: Force and Gravity Equilibrium Moment and Torque Friction Couples Forces in Frames

VU21101 APPLY PRINCIPLES OF STRENGTH OF MATERIALS TO ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply principles of strength of materials to standard engineering problems. This includes stress strain, deformation, and properties of sections, shear force and testing.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to successfully apply strength of materials solutions to common engineering problems on five different occasions.

VU21103 APPLY CALCULUS TO ENGINEERING PROBLEMS

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit of competency sets out the knowledge and skills required to apply calculus to the solution of engineering problems. This includes differentiation and integration, applications to rectilinear motion, maxima and minima and simple differential equations.
Required Reading: Refer to Learning and Assessment Plan
Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to successfully apply the correct methodology in solving a wide range of complex engineering problems using calculus.

VU21110 PLAN FOR THE IMPLEMENTATION OF MECHANICAL DRIVE SYSTEMS

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit of competency sets out the knowledge and skills required to plan for the implementation of mechanical drive systems. This includes using catalogues and drawing of components including shafts, couplings, belts, chains, gears variable speed drives, brakes, clutches, bearings, winch equipment, reciprocating drives/linear to rotational
Required Reading: Refer to Learning and Assessment Plan
Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to plan the implementation of mechanical drives systems to the specified level on more than one occasion and in different context.

VU21111 PERFORM VIBRATION MEASUREMENT AND CONTROL

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit of competency sets out the knowledge and skills required to select suitable vibration measuring equipment, use and apply the instruments required to evaluate, monitor and control machine vibrations.
Required Reading: Refer to Learning and Assessment Plan
Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to select suitable vibration measuring equipment, use and apply the instruments required to evaluate, monitor and control machine vibrations. - Obtain measurements using transducers and related instrumentation on more than one occasion and in different contexts. This includes measurement and evaluation through data analysis by employing appropriate methodology and the design of vibration control mechanisms.

VU21112 DESIGN MECHANICAL ENGINEERING SYSTEMS

Locations: Industry, Sunshine.
Prerequisites: Nil.
Description: This unit of competency sets out the knowledge and skills required to design mechanical engineering systems. This includes use of codes, catalogues and design handbooks to extract information to make appropriate calculations and/or selections. This is based on skills encompassing project management, client liaison, design options, tender documentation and technical reporting.
Required Reading: Refer to Learning and Assessment Plan
Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to design mechanical engineering systems on more than one occasion and in different contexts. This includes: writing specifications; analysing components and assembly design conditions; selecting mechanical components and materials; designing mechanical engineering systems and; documenting mechanical engineering designs.

VU21113 APPLY THERMODYNAMIC PRINCIPLES IN ENGINEERING

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply thermodynamic principles in engineering. This includes concepts, forms and principles and performing relevant calculations with respect to thermodynamics.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply thermodynamic principles to plan, conduct, or complete engineering tasks on more than one occasion and in different contexts.

VU21114 DESIGN MECHANICAL MACHINES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to design rotating machines, using catalogues and standard machine designs.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to interpret design requirements for a rotating machine to design rotating machines, using catalogues and standard machine designs on more than one occasion and in different contexts. This includes selecting mechanical machine components; and designing and documenting mechanical machines.

VU21122 PRODUCE AN ADVANCED ENGINEERING DESIGN FOR A REINFORCED CONCRETE STRUCTURE

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete an engineering project brief, including the analysis and design of complex flexural reinforced concrete members from first principles, using appropriate design aids

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit, as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to complete an engineering project brief including the analysis and design of advanced flexural reinforced concrete members of a concrete structure from first principles, using appropriate design aids on more than one occasion and in different contexts - Prepare and present reports

VU21123 PRODUCE AN ADVANCED ENGINEERING DESIGN FOR A STEEL STRUCTURE

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete an engineering project brief, including the analysis and advanced design of steel structures from first principles, using appropriate design aids.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to complete an engineering project brief including the analysis and advanced design of structural steel members in a steel structure from first principles using appropriate design aids on more than one occasion and in different contexts. - Prepare and present reports

VU21124 IMPLEMENT SITE INVESTIGATION PROCEDURES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply site investigation procedures and geological studies, through an understanding of engineering soils, major rock and mineral types, in accordance with AS 1726. This includes tests that are common to the behaviour of engineering soils, in accordance with AS 1289.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate practical activities and tests that are common to site investigation, testing and engineering analysis of soils on more than one occasion and in different context. Testing must be done in accordance to the appropriate Australian Standard.

VU21125 APPLY CONSTRUCTION PRINCIPLES TO CIVIL ENGINEERING WORKS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply the fundamental principles and concepts associated with planning, estimating and costing to the preparation and interpretation of tender documents, costs estimates and the reporting of actual versus estimated project costs. This includes the documenting of people, plant, equipment and processes employed in the building and civil construction industry.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate planning, estimating, costing and developing construction principles of a civil engineering project on more than one occasion and in different contexts.

VU21126 APPLY PRINCIPLES OF MATERIALS TO CIVIL ENGINEERING APPLICATIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required in practical activities and tests that are common in construction materials, such as aluminium, brick, timber and concrete.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate practical activities and tests that are common in construction materials, such as aluminium, brick, timber and concrete on more than one occasion and in different context. Testing must be done in accordance to the appropriate Australian Standard.

VU21127 APPLY ENVIRONMENTAL SOLUTIONS TO ENGINEERING PROJECTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to undertake an environmental study for an engineering project, including pollution problems, methods used for monitoring the environment and principles used for restoration programs.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability and skills required to undertake an environmental study on more than one occasion and in different contexts.

VU21128 APPLY PRINCIPLES OF MECHANICS TO ENGINEERING STRUCTURES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to perform analyses concerned with the mechanical properties of materials as they relate to problems of strength and stability of structures and mechanical structures. This includes the calculation of different kinds of loading on structural elements.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to perform analyses concerned with the mechanical properties of materials on more than one occasion and in different context. Analyses must be done in accordance to the appropriate Australian Standard and manufactures' manuals.

VU21129 APPLY SURVEYING FOR CIVIL ENGINEERING PROJECTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to design and establish survey control for engineering and construction purposes. This includes the measurement and calculation of survey data, drawing of sketch plans, collection and processing of topographical data for detail mapping and related computational skills.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to design and establish survey control for engineering and construction purposes. This includes the measurement of and calculation of survey data, drawing of sketch plans, collection and processing of topographical data for detail mapping and related computational skills on more than one occasion and in different contexts.

VU21130 PERFORM MEASUREMENTS AND LAYOUT TASKS ON CONSTRUCTION SITES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to perform basic measurement and layout tasks on construction sites, including the use of levels and distance measuring techniques.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to design and establish survey control for engineering and construction purposes. This includes the measurement of and calculation of survey data, drawing of sketch plans, setting out of works and related computational skills, on more than one occasion and in different contexts.

VU21131 PRODUCE AN ENGINEERING DRAINAGE DESIGN OF PIPES AND CULVERTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply principles of design for a minor culvert for a rural road using appropriate drainage standards. This includes the application of basic practices, concepts and terminology in engineering hydrology to estimate flood flow magnitude.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to design a drainage system on more than one occasion and in different contexts.

VU21132 PRODUCE AN ENGINEERING DESIGN FOR A STORMWATER RETICULATION SCHEME

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply principles of design for an engineering stormwater reticulation scheme using appropriate design standards.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to design a stormwater reticulation scheme on more than one occasion and in different contexts.

VU21133 PRODUCE AN ENGINEERING DESIGN FOR A SEWERAGE RETICULATION SCHEME

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply principles of design for an engineering sewerage reticulation scheme using appropriate design standards.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply principles of design for an engineering sewerage reticulation scheme using appropriate design standards.

VU21134 PRODUCE AN ENGINEERING DESIGN FOR A REINFORCED CONCRETE STRUCTURE

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete an engineering project brief, including the analysis and design of flexural reinforced concrete members from first principles, using appropriate design aids.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to complete an engineering project brief including the analysis and design of flexural reinforced concrete members from first principles, using appropriate design aids on a reinforced concrete structure on more than one occasion and in different contexts.

VU21135 PRODUCE AN ENGINEERING DESIGN FOR A STEEL STRUCTURE

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete an engineering project brief, including the analysis and design of simple steel structures from first principles, using appropriate design aids.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to design a steel structure on more than one occasion and in different contexts.

VU21136 PRODUCE REINFORCED CONCRETE DRAWINGS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to produce typical drawings for the detailing of reinforced concrete elements of buildings, in accordance with standard practice in AS1100.501 and AS3600.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to produce drawings of simple reinforced concrete elements on more than one occasion and in different contexts.

VU21137 PRODUCE ADVANCED ENGINEERING DRAWINGS FOR A REINFORCED CONCRETE STRUCTURE

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete advanced reinforced concrete drawings, in accordance with accepted practice as outlined in AS1100.501 and AS3600.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to produce advanced structural reinforced concrete drawings on more than one occasion and in different contexts.

VU21138 PRODUCE STRUCTURAL STEEL DRAWINGS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to provide the skills and principles necessary to produce drawings for structural steel elements, in accordance with accepted practice as outlined in AS4100 and Australian Institute of Steel Construction (AISC) manuals.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to produce structural steel drawings one more than one occasion and in different contexts.

VU21139 PRODUCE ADVANCED ENGINEERING DRAWINGS FOR A STEEL STRUCTURE

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete typical structural steel drawings in accordance with accepted practice as outlined in AS1100.501 and AS4100.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to produce structural steel drawings on more than one occasion and in different contexts.

VU21140 PRODUCE STRUCTURAL STEEL SHOP DRAWINGS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to provide the skills and principles necessary to produce structural steel shop drawings dealing with welded and bolted joint connections, in accordance with accepted practice as outlined in AS4100 and Australian Institute of Steel Construction (AISC) manuals.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to produce structural steel shop drawings on more than one occasion and in different contexts.

VU21141 PRODUCE ENGINEERING DRAWINGS FOR A RURAL ROAD

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete typical road drawings required in the geometrical layout of rural roads, to the standards of AS1100.401.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to produce drawings for the geometrical layout of typical rural roads on more than one occasion and in different contexts.

VU21142 PRODUCE DRAWINGS TO ENABLE URBAN ROAD CONSTRUCTION

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete typical road drawings required in the construction of urban roads, to the standards of AS 1100.401.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to produce urban road project drawings on more than one occasion and in different contexts.

VU21143 PRODUCE ENGINEERING DRAWINGS FOR A STORMWATER RETICULATION SCHEME

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to complete engineering drawings for a stormwater reticulation scheme, in accordance with AS1100.401 and relevant drainage standards.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to produce drawings for a stormwater reticulation scheme on more than one occasion and in different contexts. - Compile document and present results

VU21144 APPLY SURVEYING COMPUTATIONS TO CIVIL ENGINEERING PROJECTS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply computational concepts and methods that are common to civil engineering and surveying projects. This includes the conversion of survey measurements and data into surveying and mapping coordinates and computational set out data to facilitate the construction of an engineering project. This does not include the use of calculus.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply mathematical concepts to engineering problems in familiar and unfamiliar situations and in different contexts. - Verify results

VU21145 ANALYSE PIPING DESIGNS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to analyse piping designs with respect to equipment, materials, and fittings to meet design specifications, safety and economic parameters for a specific installation.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and Demonstrate the analysis of piping design on more than one occasion and in different contexts. This includes: - preparation of P&ID and line lists; - application of technical standards or codes of practice; - analysis and consequent design adjustments of material and equipment configurations within a given set of parameters using CAD systems.

VU21153 PRODUCE BASIC ENGINEERING SKETCHES AND DRAWINGS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required in the identification, selection and interpretation of a drawing or sketch, and the preparation of sketches and drawings License to practice The skills and knowledge described in this unit do not require a licence to practice in the workplace. However, practice in this unit is subject to regulations directly related to occupational health and safety and where applicable contracts of training such as apprenticeships and traineeships

Required Reading: Refer to Learning and Assessment Plan

Assessment: To be considered competent in this unit the participant must be able to demonstrate the achievement of all of the elements of competency to the level defined by their associated performance criteria and incorporating the required skills and knowledge. Specifically they must be able to: - perform each element on at least two occasions - implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range statement - demonstrate application of the Required Skills and Knowledge at a level and within timeframes appropriate to the workplace.

VU21154 GENERATE DESIGN SOLUTIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit describes the skills and knowledge required to create sound design solutions in an industry context. Sound design solutions are those which are economically viable, environmentally conscious, ergonomically appropriate and equitable for those producing the product as well as the end user. The starting point may be an open or closed brief, spontaneous idea, modification of existing product, process, or system or a point in an ongoing design process. The unit includes research and analysis of ideas and resources, plus the development of innovative concepts. It also includes a requirement for critical and informed collaboration with others about one's own work.

Required Reading: Refer to Learning and Assessment Plan

Assessment: To be considered competent in this unit the participant must be able to demonstrate the achievement of all of the elements of competency to the level defined by their associated performance criteria and incorporating the required skills and knowledge. Specifically they must be able to: - develop the design concept through a process of selecting and critically examining source material and then refining the design concept - demonstrate effective collaboration about the design concept which shows a command of relevant references, terminologies and ideas - source industry information

VU21155 IMPLEMENT DESIGN SOLUTIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit describes the skills and knowledge required to apply techniques for the design of products, prototypes, systems or models in the implementation of design solutions. Sound design solutions are those which are economically viable, environmentally conscious, ergonomically appropriate and equitable for those producing the product as well as the end user. The nature of the products may vary greatly. The outcome of the work could be a completed product, but is more likely to be a prototype or model for the product or an aspect of the product. It could also be a system. The focus of the unit is on a general knowledge of design techniques and the practical application of those techniques.

Required Reading: Refer to Learning and Assessment Plan

Assessment: To be considered competent in this unit the participant must be able to demonstrate the achievement of all of the elements of competency to the level defined by their associated performance criteria and incorporating the required skills and knowledge. Specifically they must be able to: - develop the product, prototype, system or model through a process of selecting and critically analysing source material, then testing and developing the product, prototype, system or model - effectively collaborate about the concept for own work which shows a command of relevant references, terminologies and ideas - provide evidence of the ability to source industry information

VU21156 USE COMPUTER AIDED DRAFTING SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply computer aided drafting (CAD) using 2D techniques for engineering applications. This includes complex and advanced applications of CAD systems.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Use computer aided drawing techniques to produce complex 2D drawings for a range of engineering applications. Drawings should include the applications of a representative range of drawing and modelling skills such as: o a wide range of geometric shapes; o efficient use of library files; o application of the appropriate drawing standards; o selection of most relevant drawing techniques; o hard copies of drawing.

VU21157 USE ADVANCED 2D AND 3D COMPUTER AIDED DRAFTING TECHNIQUES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to create 2D and 3D wireframe and surface models and their representation on working drawings for engineering applications.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Use computer aided drawing techniques to draw a range of complex 2D and 3D engineering applications. Drawings should include the applications of a representative range of drawing and modelling skills such as: o editing; o manipulations of shapes; o creation of views; o movement through space; o region and solid modelling techniques; o rendering; o producing hard copy output.

VU21158 DESIGN AND PROTOTYPE COMPONENTS AND/OR SMALL STRUCTURES USING ENGINEERING DESIGN PRINCIPLES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to design and prototype engineering components or small structures in an engineering context. This involves preparation of concept proposals, drawings, plans and models.

Required Reading: Refer to Learning and Assessment Plan

Assessment: To be considered competent in this unit the participant must be able to demonstrate the achievement of all of the elements of competency to the level defined by their associated performance criteria and incorporating the required skills and knowledge. Specifically they must be able to: - Perform each element on at least two occasions - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range; and - Demonstrate the required knowledge and skills as described in this unit; and - Demonstrate an appropriate level of skills enabling employment

VU21159 APPLY COMPUTER BASED SOLID MODELLING TECHNIQUES

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply modelling techniques to three-dimensional drawings to create models of solid objects for computer processing and presentation purposes. This includes applications in CAD, computer graphics and animation, rapid prototyping, medical testing, and visualisation of scientific research.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to create models of solid objects for computer processing and presentation purposes on more than one occasion and in different contexts.

VU21160 USE EXTENDED FEATURES OF CAD

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to coordinate CAD operations in the use customisation techniques to CAD applications to suit a particular context. This includes the use of extended features in the CAD applications software.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate of a variety of customisation and implementation techniques on more than one occasion and in different contexts in relation to styling features, CAD language programming, macros/icon files, configuration of CAD peripherals, and the creation of complex CAD menus.

VU21161 MANAGE CAD SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to establish, maintain and review CAD management systems as an integral part of the planning process within an engineering business.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the establishment, maintenance and review of CAD management systems. This includes development of all relevant policies and procedures applicable to a specific engineering work site, development of a CAD system implementation plan, maintenance of local standards, user support and establishment of ongoing review processes. This also may include a feasibility study for the implementation of a CAD system into an organisation for the first time.

VU21162 MANAGE CAD IN A BUSINESS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to translate the business plan into operational strategies to deliver CAD services. These strategies may involve managing CAD equipment, materials, premises and physical and human resources and the development of operational procedures.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the implementation of a CAD business plan to deliver CAD services to clients on a for profit basis. The candidate must investigate and analyse a range of CAD business opportunities, ascertain their viability and produce a business plan. From the business plan operational and human resource strategies are derived and implemented. - Candidates must also demonstrate good financial management skills and operate the CAD business within current legislative and regulative settings.

VU21200 APPLY FLUID MECHANIC PRINCIPLES IN MECHANICAL ENGINEERING

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply fluid mechanic principles in mechanical engineering. This includes the principles and applications of fluids, fluid components, fluid status, fluid flow, fluid power, and forces developed by flow in fluids. To perform calculations to determine changes, forces etc. fluid flow and headloss in pipes and through open channels, to determine operational aspects of a pump in a system and to describe the basic types of fluid machinery.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate t the application of fluid mechanics principles to the solution of engineering on more than one occasion and in different contexts.

VU21203 APPLY HYDRAULIC PRINCIPLES IN ENGINEERING

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply hydraulic principles in engineering. It involves the operation, maintenance and construction of hydraulic system and machine control circuitry.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply hydraulic principles to plan, conduct, or complete engineering tasks on more than one occasion and in different contexts.

VU21204 APPLY PNEUMATIC PRINCIPLES IN ENGINEERING

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply pneumatic principles in engineering. It involves the operation, maintenance and construction of pneumatic system and machine control circuitry.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply pneumatic principles to plan, conduct, or complete engineering tasks on more than one occasion and in different contexts.

VU21210 SET UP MANUFACTURING PROCESSES FOR ENGINEERING APPLICATIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit covers the skills and knowledge required to select and set up principal methods of manufacturing in the manufacturing industry, including metal forming operations, fabrication, powder metallurgy, machine tools and CNC.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to select and set up principal methods of manufacturing in the manufacturing industry on more than one occasion and in different contexts. This includes: o identifying and discussing engineering methods, processes and construction techniques suitable for continuous, mass, batch or jobbing shop production, work cell or sequential manufacture and assembly; and o selecting and implement engineering processes for specified manufacturing applications based on functional specifications and other factors affecting the selection decision.

VU21217 IMPLEMENT BASIC MATERIALS SCIENCE PRINCIPLES TO ENGINEERING APPLICATIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply basic principles of materials science to engineering problems applications. It involves testing of materials to evaluate the engineering properties of materials and includes the recognition of common materials used in engineering, the classification of materials, the properties of materials and the factors that influence those properties.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to successfully apply basic principles of materials science to engineering applications on more than one occasion and in different contexts.

VU21218 IMPLEMENT ADVANCED MATERIALS SCIENCE PRINCIPLES TO ENGINEERING APPLICATIONS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply advanced principles of materials science to engineering problems applications. This includes the identification and description of structure and properties of materials, metallography, heat treatment processes for metals, strengthening mechanisms, surface engineering and failure mechanisms.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to successfully apply basic principles of materials science to engineering applications on more than one occasion and in different contexts.

VU21219 SET UP MECHATRONICS ENGINEERING SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to plan and construct a mechatronics engineering system and interface it with a standard industrial programmable controller for a complete operating system. It includes all wiring and programming to achieve automation together with commissioning and troubleshooting requirements.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to construct and set up a mechatronics system on more than one occasion and in different contexts. This includes interfacing it with a standard industrial programmable controller for a complete operating system; and program and commission the system.

VU21244 APPLY PRINCIPLES OF HYDRAULICS TO PIPE AND CHANNEL FLOW

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply principles of hydraulics to pipe and channel flow in civil engineering. It provides an understanding of the processes required to collect data accurately, interpret data, verify data and apply theoretical techniques to produce flow data essential to performance.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate, in accordance with standard organisational and industry procedures, the ability to use a range of methods to: - calculate energy in pipe flows - calculate hydraulic and energy gradient for pipelines - calculate flow in open channels - calculate flows through notches and weirs - calculate proportions for an economic section.

VU21245 DESIGN A WATER RETICULATION SCHEME

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply principles of design for an engineering water reticulation scheme using appropriate design standards.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - D Plan water reticulation systems including: - identifying, analysing and defining water reticulation system design requirements, conditions and constraints - identifying and interpreting legislative, environmental, business and project management requirements - analysing a range of factors to determine hydraulic and system design components - evaluating and clarifying system plans and options for system design - managing and securing documentation to support and report project management. - evaluating design process and outcomes - managing recording, reporting and information management.

VU21246 PLAN SEWERAGE RETICULATION SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to plan sewerage reticulation systems.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Plan wastewater and sewage collection/reticulation systems including: - identifying, analysing and defining wastewater collection system planning requirements, conditions and constraints - identifying and interpreting legislative, environmental, business and project management requirements - developing scenario options for future needs and conditions - analysing a range of factors to determine catchment impacts - planning, preparing and selecting options for system design - managing and securing documentation to support and report project management. - evaluating, and consulting on proposals to gauge impact and support - making recommendations on the planning and design requirements for wastewater collection systems.

VU21247 PLAN WATER RETICULATION SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to plan water reticulation systems.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Plan either water collection or distribution systems including: - identifying, analysing and defining water distribution and reticulation system planning requirements, conditions and constraints - identifying and interpreting legislative, environmental, business and project management requirements - developing scenario options for future needs and conditions - analysing a range of factors to determine catchment and supply impacts - planning, preparing and selecting options for system design - managing and securing documentation to support and report project management - evaluating, and consulting on proposals to gauge impact and support - making recommendations on the planning and design requirements for water distribution and reticulation systems.

VU21248 DESIGN PRESSURE SEWERAGE SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply principles of design for a pressure sewerage system using appropriate design standards.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Design pressure sewerage systems, including: - identifying, analysing and defining wastewater collections systems and conditions and constraints; - identifying and interpreting legislative, environmental, business and project management requirements; - identifying and interpreting standards, codes and specifications; - analysing a range of factors to determine hydraulic and system design components; - evaluating and clarifying system plans and options for system design; - managing and securing documentation to support and report project management; - evaluating design process and outcomes; - managing, recording, reporting and information management.

VU21249 DESIGN SEWERAGE PUMPING STATION SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply principles of design for a sewerage pumping station system, using appropriate design standards.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Design sewerage pumping station systems, including: - identifying, analysing and defining sewerage pumping station design requirements, conditions and constraints; - identifying and interpreting legislative, environmental, business and project management requirements; - developing scenario options for future needs and conditions; - analysing a range of factors to determine catchment impacts; - planning, preparing and selecting options for system design; - managing and securing documentation to support and report project management; - evaluating, and consulting on proposals to gauge impact and support; - making recommendations on the planning and design requirements for sewerage pumping station systems.

VU21250 MANAGE ASSETS IN A WATER UTILITY

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the skills and knowledge required to manage the hydraulic assets in a water utility including the monitoring, maintenance, repair, replacement, valuation and recording of assets.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Manage assets in a water utility, including: - determining the condition of an asset based on field evidence and an analysis of its history; - determining the need for and specifying the maintenance of an asset and checking the maintenance has been carried out and recorded; - determining the need for and specifyin g the repair of an asset and checking the repair has been carried out and recorded; - determining the need for and specifying the replacement of an asset and checking the replacement has been carried out and recorded; - recording an asset in an asset management system; - determining the residual value of an asset.

VU21251 MANAGE DRINKING WATER QUALITY INFORMATION

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to manage drinking water quality information. It provides an understanding of key biological and chemical processes required to design a monitoring program, formulate and manage a water quality database, and assess water quality data.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Use water quality management knowledge and information to: - apply the principles of water quality science to monitoring program design - apply the principles of water science to water quality data analysis and interpretation - design and operate a water quality data base - take action if there are water quality issues.

VU21252 MANAGE THE CONSTRUCTION OF PIPELINE SYSTEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency describes the outcomes required to manage construction of pipeline systems.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the associated performance criteria, including required skills and knowledge, and be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Manage pipeline construction including: - interpreting design drawings, project documentation and relevant national, WSAA and water agency codes, supplements, specifications and product lists; - applying quality principles to pipeline construction; - ensuring the safety of people; - applying environmental management principles to pipeline construction; - installing pipes and service connections; - installing appurtenances and maintenance structures; - installing pipe embedment and support; - installing trench fill; - acceptance testing; - disinfecting water supply pipelines.

VU21400 APPLY SCIENTIFIC PRINCIPLES TO ENGINEERING PROBLEMS

Locations: Industry, Sunshine.

Prerequisites: Nil.

Description: This unit of competency sets out the knowledge and skills required to apply scientific principles to solve problems common to all engineering fields. This includes quantities and units, vector and scalar quantities, kinematics dynamics, heat and temperature, constitution of matter and error and uncertainty.

Required Reading: Refer to Learning and Assessment Plan

Assessment: Assessors must be satisfied that the candidate can competently and consistently perform all elements of the unit as specified by the criteria, including required skills and knowledge, and to be capable of applying the competency in new and different situations and contexts within the timeframes typically expected of the discipline, work function and industrial environment. Specifically they must be able to: - Implement Occupational Health and Safety workplace procedures and practices including the use of risk control measures as specified in the performance criteria and range - Demonstrate the required knowledge and skills as described in this unit; - Demonstrate a representative body of performance criteria within a timeframe typically expected of the discipline, work function and industrial environment; and - Demonstrate the ability to apply scientific principles to solve engineering problems on at least two occasions researching from each of the following areas respectively: Basic chemistry Gas laws Linear and circular motion Work energy and power Simple machines Momentum Heat and temperature Error and uncertainty in measurement

WRRI5A MAINTAIN AND ORDER STOCK

Locations: Industry.

Prerequisites: Nil.

Description: Monitor receipt and dispatch of goods; Maintain stock records; Coordinate stocktake/cyclical count; Identify stock losses; Process order; Follow up order.

Required Reading: No required text.

Assessment: This unit may be assessed by tests, assignments, classwork.