



Mechanical & Aeronautical engineering

STUDENT HANDBOOK



Clarkson
UNIVERSITY
defy convention



Wallace H. Coulter
School of Engineering

Mechanical and Aeronautical Engineering Dept.

UG Student Handbook

2011-2012

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1.0 Introduction

You will find herein information about the academic advisors, the curriculum, Clarkson services, special programs, and advice about career planning. If the information you need is not in this document, or if you require more detailed information, consult the references listed at the end. If these sources lack the answer you are looking for, see your advisor.

This handbook will be revised from time- to- time to keep pace with changes in the Department. Curricular requirements may change between revisions. Thus the handbook may not always contain the completely current curricular information. Therefore, the curricular information herein does not generally guarantee that a particular course will be taught.

2.0 Being a Student

2.1 Introduction

You may have already heard from friends, family members, or guidance counselors that you will experience a different form of education when you enter college; it is not like high school. Now, that doesn't imply that you should be apprehensive about college, but it does imply that you should keep your eyes open to the new environment and learn to adjust.

2.2 Self-reliance

During the next four years you will find yourself gaining more and more self-reliance. But self-reliance doesn't mean that you have to do everything yourself; it does mean that you ask for help when you need it and stand on your own feet when you don't. Developing self-reliance should be one of your goals in college.

2.3 Professionalism

One adjustment to college is to think of yourself as a student - professional; a student who will soon be a professional engineer. Like any professional position, there are certain expectations that you must fulfill. The best way to meet these expectations is to keep on top of things; don't let yourself fall behind. Also, go to classes prepared; have all your work and reading done, and have questions ready. Participate in the discussions, practice the problems the professors assign, and push yourself to do your best. You are building the base for your professional career; build a strong base.

The professors do not cover everything that you must know in class; they expect that you will study beyond the lecture. You will find that the professors are more like guides, and you have to play the teacher as well as the student more than you had to in high school. By forcing you to play a stronger role in your education, they are preparing you for the professional world where there are no obvious teachers.

In your senior year you will participate in a two-semester, capstone design course. In this course you will collaborate with other students in a project team. Working in this way is typical of professional life. Learn well how to do it.

Near the end of each semester each professor will give you a "course evaluation form" to fill out. The comments you make regarding the course and the professor are taken seriously. The professors' salaries, tenure, and promotion are influenced by the information on this form, and it is important that you are objective and professional in filling out these forms.

3.0 Advisors

3.1 Introduction

Each student has been assigned an academic faculty advisor from the MAE Department. The advisor - advisee lists with a picture of each MAE faculty member are displayed in the Center for Advanced Materials Processing (CAMP) adjacent to Room 253.

You may wish to change your advisor, perhaps because you have developed career interests that overlap those of another member of the MAE faculty, or for other reasons. To make a change, go to the Mechanical and Aeronautical Engineering Department office in room 253 CAMP. Request a new advisor from the secretary there. There is no need to inform your original advisor.

3.2 Advisor - Student Relationship

Visit your advisor as often as you need and do it more frequently than once a semester. This will make the advising process easier and more productive. For example, your advisor will be able to write more effective employment or other recommendations for you. So, call and schedule a meeting.

3.3 What is the Advisor's Responsibility?

The advisor's help may include career advice or help in choosing courses. Advisors will meet with each of their advisees during the course selection period. They prepare for these meetings by knowing the curriculum well. That means knowing substitute courses, course options available, and the best course for a certain area of interest. Finally, the advisor must know you, the student. Knowing your goals and interests will help them to suggest courses that suit you. After discussing your curriculum, the advisor will sign your Course Enrollment Worksheet and release your advisor hold on PeopleSoft. The advisor usually establishes special office hours for course selections and post signup sheets outside their offices.

3.4 What is the Student's Responsibility?

The student, not the advisor, is responsible for meeting Clarkson's graduation requirements. If you have not met the graduation requirements, you will not graduate, regardless of the advice you have received. Therefore, know the requirements and begin now to plan your Clarkson career. Then you can go into the course selection meeting with your choices for classes pre-selected. Details and problems can then be ironed out during your visit. Students should prepare for these meetings by reviewing their current transcript on the PeopleSoft database and printing a curriculum sheet for their class year off of the MAE Website. Students should be aware of the courses they have taken and need to take. Master Schedules of course offerings are available on the Student Administrative Services (SAS) Website www.clarkson.edu/sas/master/index.html prior to the course selection period.

4.0 Program Objectives and Outcomes

4.1 Introduction

This section describes the objectives, and the outcomes supporting those objectives, for the Mechanical Engineering (ME) and Aeronautical Engineering (AE) degree programs of the MAE Department.

4.2 Program Objectives

There are three program objectives for both the AE and ME programs.

4.2.1 AE

1. Graduates will competently apply engineering methods to solve professional problems associated with the design, manufacture, and maintenance of aircraft and related systems and they will understand the social, ethical, and environmental context of their work.
2. Graduates will communicate clearly, collaborate competently in teams, and assume leadership roles.
3. Graduates will have the habit of continuous professional development.

4.2.2 ME

1. Graduates will competently apply engineering methods to solve professional problems associated with the design, manufacture, and maintenance of mechanical systems and they will understand the social, ethical, and environmental context of their work.

Objectives 2 and 3 are the same as in the AE program.

4.3 Program Outcomes

4.3.1 Introduction. The program outcomes are the generic abilities that graduates will demonstrate that they have acquired. Acquisition of competence in these abilities shows that a graduate has met the program objective that applies to her or his program. The defining characteristics of professional problems and the process used to solve them lead directly to these generic program outcomes. Although the generic abilities to be acquired are the same for the AE and ME degrees, the technical content of the programs of course differ, as section 4.2 implies.

A professional problem is vaguely defined compared to the information necessary to solve it. Its clarification depends, however, upon proposing solutions. Some of the requirements its solution must meet may be in conflict, therefore no solution can satisfy all of them. A solution will be complex, requiring utilization and synthesis of knowledge from several fields, or requiring the discovery of new knowledge. Hence, collaboration and study will be necessary. There will be a range of possible solutions, but no unique solution: the problems are "open-ended." This is their quintessential characteristic.

“Competence,” used to characterize the acceptable performance level of certain outcomes, means sufficient ability to perform the task, unaided by the instructor, at the level of the course. This "sufficient ability" rises to the entry professional level in the required, senior-year courses.

4.3.2 Outcomes List. The AE and ME curricula have been designed to support the program outcomes listed below. The curricula are discussed in section 5.0.

- A.** *An ability to apply knowledge of mathematics, science, and engineering.*
- B.** *An ability to design and conduct experiments, as well as to analyze and interpret data.*
- C.** *An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.*
- D.** *An ability to function on multidisciplinary teams.*
- E.** *An ability to identify, formulate, and solve engineering problems.*
- F.** *An understanding of professional and ethical responsibility.*
- G.** *An ability to communicate effectively.*
- H.** *The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and social context.*
- I.** *A recognition of the need for, and an ability to engage in life-long learning.*
- J.** *A knowledge of contemporary issues.*
- K.** *An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.*

5.0 Curricula

5.1 Introduction

The instruction and experience built into the AE and ME curricula are the means by which students acquire competence in the abilities described by the program outcomes. Course descriptions may be found at www.clarkson.edu/sas/master/index.html.

5.2 Standard AE and ME Requirements

5.2.1 AE and ME Curricula. To graduate, a student must accumulate at least 120 credit hours (cr) and have a minimum cumulative total grade point average of 2.000. The credits are distributed for each degree program and graduation year as follows: Tables 5.1a and 5.1b show the standard AE curriculum for the class of 2011 and later. Tables 5.2a and 5.2b show the standard ME curriculum for the class of 2011 and later.

5.2.2 Common Experience Curriculum. There are a total of five courses which must be taken to cover six knowledge areas. At least one of these courses must be a University course. University courses are interdisciplinary courses that cover two or more knowledge areas. One of the knowledge area electives must be an economics course, EC350 is recommended.

5.2.3 Out of Class Professional Experience – the student is required to fulfill this requirement, they must submit the forms to prove completion of this requirement. The forms can be found in the Appendix L.

5.2.4 Mathematics Requirement. The required mathematics sequence consists of MA131, MA132, MA232, MA231 and MA330, with the exception that the combination of MA331 and STAT383 can substitute for MA330. Students pursuing a Minor in Mathematics should take the combination of MA331 and STAT383 to satisfy this requirement. Students interested in pursuing graduate studies in engineering are also strongly encouraged to take MA331 and STAT383 to satisfy this requirement. MA330 is not open to students who have taken or are taking MA331 or STAT383.

5.2.5 Liberal Arts Requirement (18 credits)

H&SS Minor. An H&SS minor consists of a coherent set of five courses, three of which must be taken at Clarkson, and completion of a “Minors Portfolio.” Students may choose a “Thematic Minor,” a “Disciplinary Minor,” or a “Student-Designed” minor. Thematic minors are interdisciplinary and consist of related humanities and social sciences courses addressing a common theme. The courses of a disciplinary minor must be within one of the disciplinary areas of the H&SS Department. A student-selected minor must be proposed to and approved by the School of Arts & Sciences

Knowledge Areas (KA) and University Courses (UC):

Students must achieve learning outcomes in six broad areas of knowledge listed below. The knowledge area requirement is met by completing five individual courses including at least on

University Course that unites two areas of knowledge. Together, these courses must cover all of the following areas of knowledge:

- Cultures and Societies
- Contemporary and Global Issues
- Imaginative Arts
- Science, Technology, and Society
- Individual and Group Behavior
- Economics (EC350 or equivalent)

University Course: All students must take at least one University course after the first year. University Courses will address learning outcomes in two of the six areas of knowledge. University courses are multidisciplinary, and students observe and participate in the interaction of disciplines.

Communication Points: Clarkson places a strong emphasis on developing students' abilities to communicate effectively in a variety of contexts using diverse forms of communication. Students must select coursework and possibly extracurricular activities that carry a total of at least six communication points. Courses and activities with a communication component will carry either one or two points. At least two points must come from within the student's major discipline in a 300/400 level course.

5.2.6 Course in the School of Business (3 credits). This may be any course bearing an (BUS) designator.

5.2.7 Professional Electives – (AE 6 credits – ME 9 credits).

The two AE-program professional electives and two of the three ME program electives may be MAE elective courses, courses offered by other engineering departments, by the Mathematics and Computer Science, Physics, and Chemistry departments, by the School of Business, or a three-credit multi-disciplinary (MP) project course, as long as they meet requirements (1) – (4), below. The remaining ME program elective must be at least a 300-level AE, ES, or ME course.

- (1) They are of a technical nature such that they strengthen the engineering background of the student. The management courses that satisfy this requirement are listed below:

OM331 Operations/Production Management, OM476 Management of Technology,
OM351 Quality Management and Lean Enterprise, IS400 Development of Business
Applications on the Internet

Use Appendix F to get an MP3xx course approved for meeting graduation requirements.

- (2) They do not contain material which is a duplication of material covered in previously taken courses or which will be covered in a required course;
- (3) They are advanced level courses (300 or above);
- (4) They have received prior approval from the student's academic advisor. The fundamental

criteria for approval shall be that the courses be consistent with the student's professional objective and academic program, and otherwise meet the foregoing criteria.

Students are advised to complete a plan for their professional electives no later than the fall of their junior year.

Any exception to these policies governing professional electives must be approved in writing by the department Chair or Executive Officer.

5.2.8 Undesignated Electives (AE 3 credits, ME 6 credits). An undesignated elective may be any course which does not contain a significant amount of material already covered in a student's program. *MP xxx, 3-credit courses may be used as undesignated electives:* follow the instructions in paragraph 5.2.5(1), above. Only undesignated electives may be taken "pass or no entry."

5.2.9 Non-Credit Bearing Requirements.

Freshman Seminar. Students should complete the Freshman Seminar course (FY100) during their freshman year, but in any case prior to graduation. This requirement will be waived for students who are granted at least 25 credits when they transfer to Clarkson.

Aeronautical Engineering Seminar. This seminar will introduce aerodynamic and structural concepts and terminology, principles of flight and propulsion systems, and recent advances in related areas. The seminar will draw on the MAE faculty, the AE-related expertise of active pilots, visitors from industry and universities, and senior AE students with experience in design, build, fly, and competition. It will be lively and interactive. Field trips and films will be included.

5.2.10 Special Notes for Both Degrees

Replacement Courses. For students transferring to the MAE department, blanket exceptions have been granted for the courses below:

Internal Transfer Exceptions

ES100 with CS141, EM120 and 121
ES250 with EE322
ES260 with ME290
ES330 with CH301
ES340 with ES448, CH271
AE/ME212 with CE212
ME411 with CH302
CM131 with CM103 and CM105
CM132 with CM104 and CM106

Replacement courses cannot be used to remove "F" grades.

Pass No Credit. The only courses in either the ME or the AE curriculum that can currently be taken on a pass or no-entry basis are undesignated electives. Approval must be obtained using a form from Student Administrative Services (SAS). The SAS office will convert the instructor's letter grade

to Pass (P). A grade of C or better will be considered passing. In the case of non-pass, the course will appear on your transcript with an NC (no credit) notation. ROTC (Army and Air Force) students are not permitted to enroll in MS or AS courses on a pass or no-credit basis. Consult the Clarkson Regulations for more information on pass or no-entry.

Independent Study. Students may have a special interest within the field of Mechanical or Aeronautical Engineering that they would like to study. This can be done by arranging for a professor to advise the study and registering for one of the independent study course numbers (AE/ME365, AE/ME366, AE/ME367, AE/ME465, AE/ME466) using a special section number that the course advisor will give you.

AE/ME212. Engineering students transferring at least 54 credits from another institution who do not receive transfer credit for AE/ME212 may substitute an advanced design course for AE/ME212. The course substituted for AE/ME212 may not be used to satisfy other design requirements.

Retaking MA131 and PH 131. Freshmen students who receive a grade of D+ or D in MA131 Calculus I or PH 131 Fundamentals of Physics I in the Fall semester should consider repeating these courses the following spring and should discuss this with their advisors. Note that MA 132 (MA131) is a co-requisite for PH132 (PH131). Thus PH 132 cannot be taken when repeating MA131, even if PH 131 has been passed.

AE and ME Labs. The 200-level courses will be taken in the spring by sophomores, the 300-level courses in the fall by juniors, and the 400-level courses in the spring by juniors.

5.3 Minors, Concentrations

5.3.1 Minors. To complement and enrich their degree programs, students may complete course work in designated minor programs. Minors enable students to specialize in a separate and identifiable field outside their major. Minors require at least 15 hours of relevant course work, including at least 6 credit hours taken outside the student's major field. Completion of an approved minor will be entered on a student's transcript. AE and ME students find that completing a minor in mathematics is straightforward. As noted in section 5.2.2, students pursuing a Minor in Mathematics should take the combination of MA331 and STAT383 to substitute for MA330. MA330 is not open to students who have taken or are taking MA331 or STAT383. Four courses on the list from which they may choose are part of the AE and ME Programs. The Catalog lists available minors.

Students may also complete professional concentrations. These are areas of specialization within a major field. Professional concentrations require at least 15 credit hours of relevant course work. Completion of an approved professional concentration will be entered on a student's transcript. The Catalog lists the available professional concentrations. Two are offered by the MAE Department; see section 5.3.2 and 5.3.3.

5.3.2 Manufacturing Engineering Concentration. The Mechanical and Aeronautical Engineering Department has a Professional Concentration in Manufacturing Engineering. Its requirements are set out in the list below. Interested students must fill out an application form (Appendix H) available from the Mechanical and Aeronautical Engineering Department office.

Course changes to the Manufacturing Engineering concentration requirements must be approved by the Mechanical and Aeronautical Engineering Department Chair or Executive Officer.

**Manufacturing Engineering Certificate
Required Courses**

ES260	Materials Science
STAT383	Applied Statistics I or MA330 Advanced Engineering Mathematics
OM331	Operations and Supply Chain Management
ME390	Manufacturing Processes
OM351	Quality Management and Lean Enterprise

Elective Courses – Three Required

ES351	Materials Characterization Laboratory	ME385	Design of Electromechanical Systems
ES357	Microelectronic Circuit Fabrication	ME444	Computer-aided Engineering
ES360	Materials Science and Engr. II	AE/ME457	Composite Mechanics and Design
ES365	Polymer Materials	ME492	Welding Metallurgy
ES405	Design of Experiments and Analysis of Data		

Some management courses that are required for the Manufacturing Engineering Concentration (OM331 and OM351) have STAT383 as a prerequisite. The School of Business will accept MA330 instead of STAT383 for entry into those courses.

5.3.3 Biomedical and Rehabilitation Engineering Concentration.

Biomedical and Rehabilitation Engineering Concentration
Approved list of courses
Approved April 1, 2008

Course from approved list having psychosocial or health-related content

PY253 Social Psychology
PY 355 Cognitive Psychology
PY 359 Perception
PY 360 Learning and Memory
PY 370 Developmental Psychology

PY 463 Health Psychology
POL 380 The Law and Bioethics
LC 353 Medicine and Society in America
LP 241 Medical Ethics
LP 240 Contemporary Moral Issues

LP 341 Professional Ethics
LP 380 Science, Politics, Ethics
LP 392 Special Topics: Minds and Machines
BY 412 Molecular Biology Laboratory
BY/PY 454 Physiological Psychology
BY/PY 458 Cognitive Neuroscience
BY 450 Biochemistry I
BY 451 Biochemistry II
BY 460 Neurobiology
BY 470 Biochemistry and Biotechnology Lab
BY 476 Current topics in Biology and Medicine
CM444 Medicinal Chemistry
PH526 Biophysics
HIST 394 History of Medicine in Europe and the US
ES 452 Biomaterials and Biomedical Applications

Course from approved list having biomedical and engineering design content

ME 380 Special Topics: Biomechanics
CH 465 Biochemical Engineering
Senior design courses can count for this credit if the project is biomedical or rehabilitation engineering-based, as approved by the Director of CREST. This requires cooperation with the senior design course instructor.
EE 412 Senior Design
ME 445 Integrated Design I
CP 416 Senior Design
CH 480 Design I
CE 490 Senior (Structures, Transportation, Geotechnical) Design
CE 491 Senior (Water Resources/Environmental) Design
CS459 Human Computer Interaction
EE491 Neural Engineering and Science

5.3.4 Materials Engineering Concentration. Clarkson University offers a professional concentration in Materials Engineering. A brochure describing this program may be obtained in the Mechanical and Aeronautical Engineering Department office.

5.3.5 Sustainable Energy Systems Engineering. Clarkson University offers a Minor in Sustainable Energy Systems Engineering to all students who meet the prerequisite requirements.

Our reliance on energy-rich sources of fossil fuels has enabled growth of modern society, increasing our mobility, industrial growth, domestic comfort, abundant food supply, and economic prosperity. Engineers are among the many types of professionals that need to understand the limits of our present energy systems and lead us to a future in which we can continue to provide reasonable energy resources for human quality of life. This minor emphasizes that all engineering disciplines are necessary to develop and assess technologies to both increase the efficiency of our energy use and advance renewable and alternative energy sources.

A total of 21 credits is required for this minor. Depending upon the student's major, between 9 – 12

hours of this 21 credit total are in addition to the major's core requirements. A student must complete the course requirements as follows:

Required Course (3 Credits each)

Introduction to Energy Systems	EE238
Alternative Energy Systems	EE/ES438
Thermodynamics	ES340 or CH271
Industrial Ecology	CE486
Capstone Design (with specific Energy Focus)	one of: AE451, CE490, CE491, CE492 CH481, EE412, ES456, ME446
Policy Choice	one of: EV200/300, POL470, PHIL391 POL/SOC395
Technology Choice	one of: CH434, CH421, EE331, ME310, ME324

5.4. Honors Program

For the University Honors Program (HP), the foundation computer requirement has been replaced with an Honors computer course and the "course in every school" requirement with a second year project course, Honors students have been placed in specially designed sections of LS196, the Honors science seminar and the Honors thesis are used for the undesignated electives, and one professional elective, and two Liberal Arts seminars fill the six-credit Hum/Soc requirement. The typical student will earn 25 credits in Honors classes.

Students who have been admitted to the program and are pursuing ME or AE majors should work with the Honors Program Director and the MAE department HP advisor (Professor Moosbrugger) on curriculum matters.

Table 5.3 shows how the Honors Program may be combined with the AE degree program for the class of 2010 and Table 5.4 shows how the Honors Program may be combined with the ME degree program for the class of 2010.

A student may elect to use her or his honors thesis (HP390...HP399 or HP490...HP491) to replace one or two professional electives in either the aeronautical or the mechanical engineering program. However, to be accepted as meeting our graduation requirements the thesis must at least:

1. Meet the requirements for professional electives given in section 5.2.4;
2. Support program outcomes 1, 2, 3, and 6 given in section 4.3.2;
3. Be completed (including evaluation) no later than the end of the student's final semester at Clarkson;
4. Receive an evaluation mark equivalent to at least the minimum passing grade for undergraduates given in the Clarkson Regulations. (Note: a "P" received for an honor thesis is the equivalent of a 3.25.)
5. Students wishing to use an Honors Thesis as a professional elective must submit the form in Appendix J for approval for each of the 300- and 400-level Honors Thesis Courses.

Students in the Mechanical Engineering (ME) program are required to have at least one professional elective that bears the “AE,” “ES,” or “ME” designator. The content of an Honors Thesis done for the ME program will be the equivalent to an ES-designated course; at least, and therefore can be used to satisfy this restricted designator requirement.

Table 5.1a AERONAUTICAL ENGINEERING CURRICULUM
CLASS OF 2011, 2012, 2013 and 2014 Updated 2/15/11

Student
Advisor:

Student No:
Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV 190 Clarkson Seminar		(F)***	KA Elective		(S)
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II (4cr)		(S)
PH131 Fund of Physics I (4cr)		(F/S)	PH132 Fund of Physics II (4cr)		(F/S)
FYS (1cr)		(F)	ES100 Intro Engr Use of Compu (2cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(F/S)
ES260 Materials Science (TECH)		(F/S)	AE/ME212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
KA/UC Elective			KA/UC Elective		
AE200 Aero Engineering Seminar (0cr)		(F)	AE201 Aero. Eng Lab I (C2) (1cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	AE/ME425 Aerodynamics		(S)
ES340 Thermodynamics		(F/S)	AE429 Aircraft Perf & Flight Mech		(S)
AE/ME350 Aircraft Structures		(F)	AE458 Design of Aircraft Structures		(S)
Business Elective			MA330** Advanced Eng Math		(F/S)
AE/ME455 Mech Vibrations & Control		(F)	AE401 Aero. Eng Lab III (1cr)		(S)
AE301 Aero. Eng Lab II (C2) (1cr)		(F)	Undesignated Elective		
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
AE450 Aircraft Design I (C1)		(F)	AE451 Aircraft Design II (TECH)		(S)
AE430 Stab Contrl of Aerospace Vehicles		(F)	AE427 Design of Propulsion Sys (C2)		(S)
AE/ME431 Gas Dynamics		(F)	Professional Elective		
Professional Elective			KA/UC Elective		
Economics Elective					
ES499 Professional Experience (0cr)					
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
Knowledge Areas**** and Comm. Pts. if any (One from each area required) CGI ____ IA ____ CSO ____ IG ____ EC ____ STS ____		University Course and Comm. 2 Course (One C2 course and one UC course required) UC ____ (Not to be Taken by Freshmen)		Professional Experience Paperwork: ____ Pre Approval Form ____ Completion Form	

*Superscripts refer to outcomes as per ABET and the Clarkson Common Experience Requirements. **or MA331 and STAT383.

Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring. *Students are required to take five courses to fulfill the Knowledge Area (KA) requirements. Of the five, one is a University Course (UC) which covers two KAs. Note: Many KA's have Communications Points (CP) = 0. One of the knowledge area electives must be an economics course, EC350 is recommended.

Table 5.1b AERONAUTICAL ENGINEERING AUDIT SHEET
CLASS OF 2011, 2012, 2013 & 2014

Course No.	Course Title	CR.	Semester Offered	Pre-Requisites	Co-Requisites
UNIV190	Clarkson Seminar	3	F		
	KA Elective	3	S		
CM131	Gen Chem I	4	F		
CM132	Gen Chem II	4	S	CM131	
PH131	Fund Physics I	4	F/S		MA131
PH132	Fund Physics II	4	F/S	PH131	MA132
MA131	Calculus I	3	F/S		
MA132	Calculus II	3	F/S	MA131	
MA231	Calculus III	3	F/S	MA132	
MA232	Elem Diff Equat	3	F/S	MA132	
MA330	Adv Engr Math	3	F	MA231, MA232	
ES100	Intr Engr Use Comp	2	S		
	FYS	1	F		
AE200	Aero Engineering Seminar	0	F		
ES220	Statics	3	F/S	MA131, PH131	
ES222	Strength of Materials	3	F/S	ES220 or Consent of Inst.	
ES223	Rigid Body Dynamics	3	S	ES220, MA232	
ES250	Electrical Science	3	F/S		MA232, PH132
ES260	Materials Science	3	F/S	PH131, CM131, MA132	
ES330	Fluid Mechanics	3	F/S	MA232 or MA231, ES220	
ES340	Thermodynamics	3	F/S	MA231, PH132	
AE/ME212	Intro to Engr Design	3	S	ES100, ES220, ES260	
AE201	Exp. Method Aero	1	S		ES220, ES222, ES223, ES250
AE301	Exp. Method Aero	1	F		ES330, ES340
AE401	Exp. Method Aero	1	S	AE/ME201 or AE/ME301	AE425 or AE455
AE/ME350	Aircraft Structures	3	F	ES222, ES223	
AE/ME425	Aerodynamics	3	S	ES330, ES340, MA231	
AE427	Design of Propulsion Sys	3	S	ME326, AE/ME431, ES340	
AE429	Aircraft Perf & Flight Mech	3	S		AE/ME425
AE430	Stab Cntrl of Aero Vehicles	3	F	AE/ME455, MA231, MA232	
AE/ME431	Gas Dynamics	3	F	ES330, ES340, MA232	
AE450	Aircraft Design I	3	F	AE200, AE425, AE429, AE458	AE430, AE431
AE451	Aircraft Design II	3	S	AE450	AE427
AE/ME455	Mech Vibrations & Control	3	F	ES223	
AE458	Design of Aircraft Structs	3	S	AE350	
	Economics Elective	3			
	KA/UC Elective	3			
	KA/UC Elective	3			
	KA/UC Elective	3			
	Business Elective	3			
	Professional Elective	3			
	Professional Elective	3			
	Undesignated Elective	3			
ES499	Professional Experience	0		Consent of Instructor	
	Total Credits	121			

Table 5.2a MECHANICAL ENGINEERING CURRICULUM
CLASS OF 2011, 2012, 2013 & 2014 Updated 2/15/11*

Student Name:

Student No:

Advisor:

Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV190 Clarkson Seminar		(F)***	KA Elective		(S)
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II (4cr)		(S)
PH131 Fund of Physics I (4cr)		(F/S)	PH132 Fund of Physics II (4cr)		(F/S)
FYS (1cr)		(F)	ES100 Intro Engr Use of Compu (2cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(S)
ES260 Materials Science (TECH)		(F/S)	AE/ME212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
KA/UC Elective			KA/UC Elective		
			ME201 Mech. Eng Lab I (C2) (1cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	ME326 Intermediate Fluid Mechanics		(F/S)
ES340 Thermodynamics		(F/S)	ME341 Mech of Machine Elements		(F/S)
ME324 Dynamical Systems		(F/S)	ME411 Introduction to Heat Transfer		(F/S)
MA330** Advanced Eng Math		(F/S)	ME310 Thermodynamics Sys Eng (or) ME455 Mech Vibrations & Control		(F/S)
KA/UC Elective			Economics Elective		
ME301 Mech Eng Lab II (C2) (1cr)		(F)	ME401 Mech Eng Lab III (1cr)		(S)
GPA= CUM.GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
ME442 Engineering Analysis by FEM(C2)		(F/S)	Professional Elective		
ME445 Integrated Design I (Tech)		(F/S)	Business Elective		
AE- ES- or ME- Professional Elective			ME446 Integrated Design II (C1)		(F/S)
Professional Elective			Undesignated Elective		
Undesignated Elective			ES499 Professional Experience (0cr)		
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
Knowledge Areas**** and Comm. Pts. if any (One from each area required) CGI ____ IA ____ CSO ____ IG ____ EC ____ STS ____		University Course (One UC course required) UC ____ (Not to be Taken by Freshmen)		Professional Experience Paperwork: ____ Pre Approval Form ____ Completion Form	

*Superscripts refer to outcomes as per ABET and the Clarkson Common Experience Requirements.

or MA331 and STAT383. *Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring

****Students are required to take five courses to fulfill the Knowledge Area (KA) requirements. Of the five, one is a University Course (UC) which covers two KA's. Note: Many KA's have Communications Points (CP) = 0. One of the knowledge areas must be an Economics elective, EC350 is recommended.

Table 5.2b MECHANICAL ENGINEERING AUDIT SHEET
CLASS OF 2011, 2012, 2013 & 2014

Course No.	Course Title	CR.	Semester Offered	Pre-Requisite	Co Requisite
UNIV190	Clarkson Seminar	3	F		
	KA Elective	3	F/S		
CM131	Gen Chem I	4	F		
CM132	Gen Chem II	4	S	CM131	
PH131	Fund Physics I	4	F/S		MA131
PH132	Fund Physics II	4	F/S	PH131	MA132
MA131	Calculus I	3	F/S		
MA132	Calculus II	3	F/S	MA131	
MA231	Calculus III	3	F/S	MA132	
MA232	Elem Diff Equat	3	F/S	MA132	
MA330	Adv Engr Math	3	F	MA231, MA232	
ES100	Intr Engr Use Comp	2	S		
FY100	First Year Seminar	1	F		
ES220	Statics	3	F/S	MA131, PH131	
ES222	Strength of Materials	3	F/S	ES220 or Consent of Inst.	
ES223	Rigid Body Dynamics	3	S	ES220, MA232	
ES250	Electrical Science	3	F/S		MA232, PH132
ES260	Materials Science	3	F/S	PH131, CM131, MA132	
ES330	Fluid Mechanics	3	F/S	MA232 or MA231, ES220	
ES340	Thermodynamics	3	F/S	MA231, PH132	
AE/ME212	Intro to Engr Design	3	S	ES100, ES220, ES260	
ME201	Mech Eng Lab I	1	S		ES220, ES222, ES223, ES250
ME301	Mech Eng Lab II	1	F		ES330, ES340
ME401	Mech Eng Lab III	1	S	AE/ME201 or AE/ME301	ME411 or ME326
ME310	Thermodynamics Sys Engr.	3	S	ES340	
ME455	Mech Vibrations & Control	3	F	ES223	
ME324	Dynamical Systems	3	F/S	MA232	
ME326	Interm Fluid Mechanics	3	F/S	ES330, ES340, MA232	
ME341	Mech of Machine Elem	3	F/S	ES222	ES260
ME411	Intro to Heat Transfer	3	F/S	ES330, ES340, MA232	
ME442	Engr Analysis by FEM	3	F/S	ME341 or AE/ME350	ME411
ME445	Integrated Design I	3	F/S	ME212, ES330, ES340	ME341
ME446	Integrated Design II	3	F/S	ME445	
	Economics Elective	3			
	KA/UC Elective	3			
	KA/UC Elective	3			
	KA/UC Elective	3			
	Business Elective	3			
	AE-ES-ME Prof Elective	3			
	Professional Elective	3			
	Professional Elective	3			
	Undesignated Elective	3			
	Undesignated Elective	3			
ES499	Professional Experience	0			
	Total Credits	121			

**Table 5.3 AERONAUTICAL ENGINEERING CURRICULUM
CLASS OF 2011, 2012, 2013 & 2014– HONORS PROGRAM***

Student Name:

Student No:

Advisor:

Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV 190 University Seminar		(F)****	MA132 Calculus II		(S)
MA131 Calculus I		(F/S)	CM132 General Chemistry II (4cr)		(F/S)
CM131 General Chemistry I (4cr)		(F)	PH132 Fund of Physics II (4cr)		(S)
PH131 Fund of Physics I (4cr)		(F/S)	HP101 COMP as Intell Tool II Soc Imp Info Seminar		(S) Replaces KA/UC Elective
HP100 Comp as Intell Tool I		(F) Replaces ES100			
FYS (1cr)		(F)			
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(F/S)
ES260 Materials Science		(F/S)	AE/ME212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
AE200 Aero Engineering Seminar (0cr)		(F)	AE201 Mech. Eng Lab I (1cr)		(S)
HP200, 202,..., or 210 Proj Course		(F) Replaces Bus. Elective	HP201 Honors Great Ideas		(S) Replaces KA Elective
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	AE/ME425 Aerodynamics		(S)
ES340 Thermodynamics		(F/S)	AE429 Aircraft Perf & Flight Mech		(S)
AE/ME350 Aircraft Structures		(F)	AE458 Design of Aircraft Structures		(S)
MA330** Advanced Eng Math		(F)	AE401 Mech Eng Lab III (1cr)		(S)
AE/ME455 Mech Vibrations & Control		(F)	HP390, 391,... or 399 Honors Thesis		(S) ***See Note
AE301 Mech Eng Lab II (1cr)		(F)	HP370 Honors Colloquium (1cr)		(S) Optional
HP300, 301,... or 310 Science Sem					
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
AE450 Aircraft Design I		(F)	AE451 Aircraft Design II		(S)
AE430 Stab Contrl of Aerospace Vehicles		(F)	Economics Elective		
AE/ME431 Gas Dynamics		(F)	AE427 Design of Propulsion Sys		(S)
HP490, 491,... or 499 Honors Thesis		(F) ***See Note	Undesignated Elective		
HP470 Honors Coloquium (1cr)		(F) Optional	HP400 Seminar on Modernity The Citizen & the Good Life		(S) Replaces KA/UC Elective
ES499 Professional Experience (0cr)					
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		

*Superscripts refer to outcomes as described in the MAE Student Handbook. **or MA331 and STAT383.

***HP390 & HP 490 may each serve as a Professional Elective: Appendix L approval required for each.

****Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring

*****Professor David Craig is responsible for students in the Honors Program meeting the Clarkson Common Experience requirements.

Table 5.4 MECHANICAL ENGINEERING CURRICULUM
CLASS OF 2011, 2012, 2013 & 2014 – HONORS PROGRAM Updated 3/12/10*

Student Name:

Student No:

Advisor:

Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV 190 Clarkson Seminar		(F)****	MA132 Calculus II		(F/S)
MA131 Calculus I		(F/S)	CM132 General Chemistry II (4cr)		(S)
CM131 General Chemistry (4cr)		(F)	PH132 Fund of Physics II (4cr)		(F/S)
PH131 Fund of Physics I (4cr)		(F/S)	HP101 Comp as Intell Tool II Soc Imp Info Seminar		(S) Replaces KA/UC Elective
HP100 Comp as Intell Tool I		(F) Replaces ES100			
FYS (1cr)		(F)			
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(F/S)
ES260 Materials Science		(F/S)	AE/ME212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
HP200,..., or 210 Project Course		(F) Replaces Bus. Elective	ME201 Mech. Eng Lab I (1cr)		(S)
			HP201 Honors Great Ideas		(S) Replaces KA Elective
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	ME326 Intermediate Fluid Mechanics		(F/S)
ES340 Thermodynamics		(F/S)	ME341 Mech of Machine Elements		(F/S)
ME324 Dynamical Systems		(F/S)	ME411 Introduction to Heat Transfer		(F/S)
MA330** Advanced Eng Math		(F/S)	ME401 Mech Eng Lab III (1cr)		(S)
ME310 Thermodynamics Sys Eng (or)		(S)	HP390,391,... or 399 Honors Thesis		(S) ***See Note
ME455 Mech Vibrations & Control		(F)			
HP300,301,..., or 310 Science Seminar		Undesignated Elec.	HP370 Honors Colloquium (1cr)		(S) Optional
ME301 Mech Eng Lab II (1cr)		(F)			
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
ME442 Engineering Analysis by FEM		(F/S)	Economics Elective		
ME445 Integrated Design I		(F/S)	Undesignated Elective		
AE- ES- or ME- Professional Elective		***See Note	ME446 Integrated Design II		(F/S)
HP490, 491,...or 499 Honors Thesis		(F) ***See Note	HP400 Seminar on Modernity The Citizen & the Good Life		(S) Replaces KA/UC Elective
Undesignated Elective					
HP470 Honors Colloquium (1cr)		(S) Optional			
ES499 Professional Experience (0cr)					
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		

*Superscripts refer to outcomes as described in the MAE Student Handbook. **or MA331 and STAT383.

***HP390 & HP 490 may each serve as a Professional Elective: Appendix L approval required for each.

****Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring

***** Professor David Craig is responsible for students in the Honors Program meeting the Clarkson Common Experience requirements.

Table 5.5 DOUBLE MAJOR AERONAUTICAL/MECHANICAL ENGINEERING CURRICULUM

CLASS OF 2011, 2012, 2013 & 2014 Updated 3/12/10*

Student Name:

Student No:

Advisor:

Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV 190 Clarkson Seminar		(F)***	KA Elective		(S)
MA131 Calculus I ^{2(m)}		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II (4cr)		(S)
PH131 Fund of Physics I (4cr)		(F/S)	PH132 Fund of Physics II (4cr)		(F/S)
FYS (1cr)		(F)	ES100 Intro Engr Use of Compu (2cr)		(S)
GPA= CUM. GPA= STATUS=					
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(F/S)
ES260 Materials Science		(F/S)	AE212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
KA/UC Elective			KA/UC Elective		
AE200 Aero Engineering Seminar (0cr)		(F)	AE201 Aero. Eng Lab I (C1) (1cr)		(S)
GPA= CUM. GPA= STATUS=					
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	AE/ME425 Aerodynamics		(S)
ES340 Thermodynamics		(F/S)	AE429 Aircraft Perf & Flight Mech		(S)
AE/ME350 Aircraft Structures		(F)	AE458 Design of Aircraft Structures		(S)
Business Elective			MA330** Advanced Eng Math		(F/S)
AE/ME455 Mech Vibrations & Control		(F)	AE401 Aero Eng Lab III (1cr)		(S)
AE301 Aero Eng Lab II (C2) (1cr)		(F)	ME411 Introduction to Heat Transfer		
GPA= CUM. GPA= STATUS=					
FALL	GR	SENIOR	SPRING	GR	SENIOR
AE450 Aircraft Design I (C1)		(F)	AE451 Aircraft Design II (Tech)		(S)
AE430 Stab Control of Aerospace Vehicles		(F)	AE427 Design of Propulsion Sys (C2)		(S)
AE/ME431 Gas Dynamics		(F)	ME324 Dynamical Systems		
ME341 Mech of Machine Elements			KA/UC Elective		
Economics Elective			ME442 Engineering Analysis by FEM		
ES499 Professional Experience (0cr)		(F)			
GPA= CUM. GPA= STATUS=					
Knowledge Areas**** and Comm. Pts. if any (One from each area required) CGI ____ IA ____ CSO ____ IG ____ EC ____ STS ____		University Course (One UC course required) UC ____ (Not to be Taken by Freshmen)		Professional Experience Paperwork: ____ Pre Approval Form ____ Completion Form	

*Superscripts refer to outcomes as per ABET and the Clarkson Common Experience Requirements. **or MA331 and STAT383.

Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring. *Students are required to take five courses to fulfill the Knowledge Area (KA) requirements. Of the five, one is a University Course (UC) which covers two KA's. Note: Many KA's have Communications Points (CP) = 0. One of the knowledge areas must be an Economics elective, EC350 is recommended.

Table 5.6 MECHANICAL ENGINEERING CURRICULUM
CLASS OF 2015 AND LATER – HONORS PROGRAM Updated 8/10/11*

Student Name:

Student No:

Advisor:

Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II (4cr)		(S)
PH131 Fund of Physics I or (4cr) ES110 Engineering & Society (STS)		(F/S)	PH131 Fund of Physics I (4cr) PH132 Fund of Physics II (4cr)		(F/S)
HP100 /HP102Comp as Intell Tool I		(F) Replaces ES100	HP101/ HP103 Comp as Intell Tool II Soc Imp		(S) Replaces KA/UC Elective
FYS (1cr)		(F)			
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(F/S)
ES260 Materials Science		(F/S)	ME212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
HP200,..., or 210 Project Course		(F)	ME201 Mech. Eng Lab I (1cr)		(S)
			HP201 Honors Great Ideas		(S) Replaces KA Elec.
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	ME326 Intermediate Fluid Mechanics		(F/S)
ES340 Thermodynamics		(F/S)	ME341 Mech of Machine Elements		(F/S)
ME324 Dynamical Systems		(F/S)	ME411 Introduction to Heat Transfer		(F/S)
MA330** Advanced Eng Math		(F)	ME401 Mech Eng Lab III (1cr)		(S)
ME310 Thermodynamics Sys Eng (or) ME455 Mech Vibrations & Control		(S) (F)	HP390,391,... or 399 Honors Thesis		(S) ***See Note
HP300,301,..., or 310 Science Seminar		(F) Replaces KA Elective	HP370 Honors Colloquium (1cr)		(S) Optional
ME301 Mech Eng Lab II (1cr)		(F)			
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
ME442 Engineering Analysis by FEM		(F/S)	Economics Elective		
ME445 Integrated Design I		(F/S)	Undesignated Elective		
AE- ES- or ME- Professional Elective		***See Note	ME446 Integrated Design I		(F/S)
HP490, 491,...or 499 Honors Thesis		(F) ***See Note	HP400 Seminar on Modernity The Citizen & the Good Life		(S) Replaces KA/UC Elective
Undesignated Elective			ES499 Professional Elective (0cr)		
HP470 Honors Colloquium (1cr)		(S) Optional			
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
Superscripts refer to outcomes as described in the MAE Student Handbook. **or MA331 <u>and</u> STAT383. ***HP390 & HP 490 may each serve as a Professional Elective: Appendix L approval required for each. ****Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring ***** Professor John Goss is responsible for students in the Honors Program meeting the Clarkson Common Experience requirements.				Prof. Experience Paperwork: ___Pre ___ Completion	

Table 5.7 AERONAUTICAL ENGINEERING CURRICULUM
CLASS OF 2015 AND LATER – HONORS PROGRAM Updated 8/10/11*

Student Name:

Student No:

Advisor:

Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
MA131 Calculus I		(F/S)	MA132 Calculus II		(S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II (4cr)		(F/S)
PH131 Fund of Physics I (4cr)		(F/S)	PH132 Fund of Physics II (4cr)		(S)
HP100/102 Comp as Intell Tool I		(F) Replaces ES100	HP101/103 COMP as Intell Tool II Soc Imp Info Seminar		(S) Replaces KA/UC Elective
FYS ^I (1cr)		(F)			
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(F/S)
ES260 Materials Science		(F/S)	AE212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
HP200, 202,..., or 210 Proj Course		(F)	AE201 Mech. Eng Lab I (1cr)		(S)
			HP201 Honors Great Ideas		(S) Replaces KA Elective
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	AE/ME425 Aerodynamics		(S)
ES340 Thermodynamics		(F/S)	AE429 Aircraft Perf & Flight Mech		(S)
AE/ME350 Aircraft Structures		(F)	AE458 Design of Aircraft Structures		(S)
MA330** Advanced Eng Math		(F)	AE401 Mech Eng Lab III (1cr)		(S)
AE/ME455 Mech Vibrations & Control		(F)	HP390, 391,... or 399 Honors Thesis		(S) ***See Note
AE301 Mech Eng Lab II (1cr)		(F)	HP370 Honors Colloquium (1cr)		(S) Optional
HP300, 301,... or 310 Science Sem					
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
AE450 Aircraft Design I		(F)	AE451 Aircraft Design II		(S)
AE430 Stab Contrl of Aerospace Vehicles		(F)	Economics Elective		
AE/ME431 Gas Dynamics		(F)	AE427 Design of Propulsion Sys		(S)
HP490, 491,... or 499 Honors Thesis		(F) ***See Note	Undesignated Elective		
HP470 Honors Colloquium (1cr)		(F) Optional	HP400 Seminar on Modernity The Citizen & the Good Life		(S) Replaces KA/UC Elective
ES499 Professional Experience (0cr)					
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
*Superscripts refer to outcomes as described in the MAE Student Handbook. **or MA331 and STAT383. ***HP390 & HP 490 may each serve as a Professional Elective: Appendix L approval required for each. ****Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring *****Professor John Goss is responsible for students in the Honors Program meeting the Clarkson Common Experience requirements.				Prof. Exp. Paperwork ____ Pre ____ Completion	

Table 5.8 AERONAUTICAL ENGINEERING CURRICULUM
CLASS OF 2015 AND LATER Updated 8/10/11*

Student:
Advisor:

Student No:
Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV 190 Clarkson Seminar		(F)***	KA Elective		(S)
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II (4cr)		(S)
PH131 Fund of Physics I or (4cr)		(F/S)	PH131 Fund of Physics I or (4cr)		(F/S)
ES110 Engineering and Society (STS) (3cr)			PH132 Fund of Physics II (4cr)		
FYS (1cr)		(F)	ES100 Intro Engr Use of Compu (2cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(F/S)
ES260 Materials Science (TECH)		(F/S)	AE212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
KA/UC Elective or (3cr)		(F/S)	KA/UC Elective		
PH132 Fund Phy II (4cr)					
			AE201 Aero. Eng Lab I (C2) (1cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	AE/ME425 Aerodynamics		(S)
ES340 Thermodynamics		(F/S)	AE429 Aircraft Perf & Flight Mech		(S)
AE/ME350 Aircraft Structures		(F)	AE458 Design of Aircraft Structures		(S)
Professional 1 Elective*			MA330** Advanced Eng Math		(F/S)
AE/ME455 Mech Vibrations & Control		(F)	AE401 Aero. Eng Lab III (1cr)		(S)
AE301 Aero. Eng Lab II (C2) (1cr)		(F)	Undesignated Elective		
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
AE450 Aircraft Design I (C1)		(F)	AE451 Aircraft Design II (TECH)		(S)
AE430 Stab Control of Aerospace Vehicles		(F)	AE427 Design of Propulsion Sys (C2)		(S)
AE/ME431 Gas Dynamics		(F)	Professional Elective**		
Professional Elective**			KA/UC Elective		
Economics Elective			ES499 Professional Experience (0cr)		
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
Knowledge Areas**** and Comm. Pts. if any (One from each area required)		University Course and Comm. 2 Course (One C2 course and one UC course required)		Professional Experience Paperwork:	
CGI ____ IA ____ CSO ____ IG ____ EC ____ STS ____		UC ____ (Not to be Taken by Freshmen)		____ Pre Approval Form ____ Completion Form	

*Superscripts refer to outcomes as per ABET and the Clarkson Common Experience Requirements.

or MA331 and STAT383. *Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring

****Students are required to take five courses to fulfill the Knowledge Area (KA) requirements. Of the five, one is a University Course (UC) which covers two KAs. Note: Many KA's have Communications Points (CP) = 0. One of the knowledge area electives must be an economics course, EC350 is recommended.

• Professional 1 Elective – any 200 level or above Math, Science, Engineering, or Business course.

•• Professional Elective – any 300 level technical course in Math, Science, Engineering or Business.

Table 5.9 MECHANICAL ENGINEERING CURRICULUM
CLASS OF 2015 AND LATER Updated 8/10/11*

Student Name:

Student No:

Advisor:

Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV190 Clarkson Seminar		(F)***	KA Elective		(S)
MA131 Calculus I		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II (4cr)		(S)
PH131 Fund of Physics I or (4cr) ES110 Engineering and Society (STS)(3cr)		(F/S)	PH131 Fund of Physics I or (4cr) PH132 Fund of Physics II (4cr)		(F/S) (F/S)
FYS (1cr)		(F)	ES100 Intro Engr Use of Compu (2cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(S)
ES260 Materials Science (TECH)		(F/S)	ME212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
KA/UC Elective or PH132 Fund of Physics II (4cr)		(F/S)	KA/UC Elective		
			ME201 Mech. Eng Lab I (C2) (1cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	ME326 Intermediate Fluid Mechanics		(F/S)
ES340 Thermodynamics		(F/S)	ME341 Mech of Machine Elements		(F/S)
ME324 Dynamical Systems		(F/S)	ME411 Introduction to Heat Transfer		(F/S)
MA330** Advanced Eng Math		(F)	ME310 Thermodynamics Sys Eng (or) ME455 Mech Vibrations & Control		(S) (F)
KA/UC Elective		(F/S)	Economics Elective		
ME301 Mech Eng Lab II (C2) (1cr)		(F)	ME401 Mech Eng Lab III (1cr)		(S)
GPA= CUM.GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
ME442 Eng. Analysis by FEM (C2)		(F/S)	Professional Elective**		
ME445 Integrated Design I (Tech)		(F/S)	Professional 1Elective*		
AE- ES- or ME- Professional Elective			ME446 Integrated Design II (C1)		(F/S)
Professional Elective**			Undesignated Elective		
Undesignated Elective			ES499 Professional Experience (0cr)		
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
Knowledge Areas**** and Comm. Pts. if any (One from each area required) CGI ____ IA ____ CSO ____ IG ____ EC ____ STS ____		University Course (One UC course required) UC ____ (Not to be Taken by Freshmen)		Professional Experience Paperwork: ____ Pre Approval Form ____ Completion Form	

*Superscripts refer to outcomes as per ABET and the Clarkson Common Experience Requirements.

or MA331 and STAT383. *Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring

****Students are required to take five courses to fulfill the Knowledge Area (KA) requirements. Of the five, one is a University Course (UC) which covers two KA's. Note: Many KA's have Communications Points (CP) = 0. One of the knowledge area electives must be an economics course, EC350 is recommended.

- Professional 1 Elective – any 200 level or above Math, Science, Engineering, or Business course.
- Professional Elective – any 300 level technical course in Math, Science, Engineering or Business.

Table 5.10 DOUBLE MAJOR AERONAUTICAL/MECHANICAL ENGINEERING CURRICULUM
CLASS OF 2015 AND LATER Updated 8/10/11*

Student Name:

Student No:

Advisor:

Class:

FALL	GR	FRESHMAN	SPRING	GR	FRESHMAN
UNIV 190 Clarkson Seminar		(F)***	KA Elective		(S)
MA131 Calculus I ^{2(m)}		(F/S)	MA132 Calculus II		(F/S)
CM131 General Chemistry I (4cr)		(F)	CM132 General Chemistry II (4cr)		(S)
PH131 Fund of Physics I or (4cr) ES110 Engineering and Society(STS) (3cr)		(F/S)	PH131 Fund of Physics I (4cr) PH132 Fund of Physics II (4cr)		(F/S) (F/S)
FYS (1cr)		(F)	ES100 Intro Engr Use of Compu (2cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SOPHOMORE	SPRING	GR	SOPHOMORE
ES220 Statics		(F/S)	ES222 Strength of Materials		(F/S)
ES250 Electrical Science		(F/S)	ES223 Rigid Body Dynamics		(F/S)
ES260 Materials Science		(F/S)	AE212 Intro to Engineer Design		(S)
MA232 Elem Differential Equations		(F/S)	MA231 Calculus III		(F/S)
KA/UC Elective or PH132 Fund of Physics II (4cr)		(F/S)	KA/UC Elective		
			AE201 Aero. Eng Lab I (C2) (1cr)		(S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	JUNIOR	SPRING	GR	JUNIOR
ES330 Fluid Mechanics		(F/S)	AE/ME425 Aerodynamics		(S)
ES340 Thermodynamics		(F/S)	AE429 Aircraft Perf & Flight Mech		(S)
AE/ME350 Aircraft Structures		(F)	AE458 Design of Aircraft Structures		(S)
MA330** Advanced Eng Math		(F)	Professional I Elective*		
AE/ME455 Mech Vibrations & Control		(F)	AE401 Aero Eng Lab III (1cr)		(S)
AE301 Aero Eng Lab II (C2) (1cr)		(F)	ME411 Introduction to Heat Transfer		(F/S)
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
FALL	GR	SENIOR	SPRING	GR	SENIOR
AE450 Aircraft Design I (C1)		(F)	AE451 Aircraft Design II (Tech)		(S)
AE430 Stab Contrl of Aerospace Vehicles		(F)	AE427 Design of Propulsion Sys (C2)		(S)
AE/ME431 Gas Dynamics		(F)	ME324 Dynamical Systems		(F/S)
ME341 Mech of Machine Elements		(F/S)	KA/UC Elective		
Economics Elective			ME442 Engineering Analysis by FEM		(F/S)
ES499 Professional Experience (0cr)					
GPA= CUM. GPA= STATUS=			GPA= CUM. GPA= STATUS=		
Knowledge Areas**** and Comm. Pts. if any (One from each area required) CGI _____ EC _____ IA _____ CSO _____ IG _____ STS _____		University Course (One UC course required) UC _____ (Not to be Taken by Freshmen)		Professional Experience Paperwork: _____ Pre Approval Form _____ Completion Form	

*Superscripts refer to outcomes as per ABET and the Clarkson Common Experience Requirements.

or MA331 and STAT383. *Courses are offered as follows: F – Fall, S – Spring, F/S – Fall and Spring

****Students are required to take five courses to fulfill the Knowledge Area (KA) requirements. Of the five, one is a University Course (UC) which covers two KAs.
 Note: Many KA's have Communications Points (CP) = 0. One of the Knowledge Area electives must be an Economics course, EC350 is recommended.

• Professional I Elective – any 200 level or above Math, Science, Engineering, or Business course.

6.0 Other Programs

You are not limited to only one degree or one specific area of study. You may decide to obtain dual degrees, a double major, a second degree, or a concentration as described earlier. Clarkson also has an Engineering MBA-MS 4+1 program.

6.1 Dual Degree

Dual degree is the simultaneous awarding of two Clarkson bachelor's degrees at one commencement; for instance, a Mechanical Engineering Degree and a Civil Engineering Degree. To do this you must complete 150 credit hours with at least 30 credit hours unique to each program. To obtain a dual degree you must complete a form which can be obtained from the department secretaries or from the SAS office. A copy of this form is shown in Appendix A.

6.2 Second Degree

A second degree is the non-simultaneous awarding of two Clarkson bachelor's degrees at two different commencements. To do this, 150 credit hours with at least 30 credit hours unique to each program must be completed. Also, at least 12 credit hours (6 of which are upper level courses) toward the second degree must be completed in residence after the awarding of the first degree. To obtain a second degree you have to be readmitted to Clarkson through the Student Administrative Services office.

6.3 Double Majors

6.3.1 Introduction. You may decide to pursue two majors while at Clarkson. Your advisor should be able to direct you to a source that can tell you the courses needed to complete the second major. Appendix B must be completed to establish your double major. According to the Clarkson Regulations, a double major¹ "...is awarded when the student satisfies all curricular requirements for two bachelor's degree programs but does not qualify for a second degree or a dual degree. A double major degree requires the completion of all requirements for both programs prior to graduation." Unlike the dual degree, however, there is no requirement for a minimum number of credits unique to each program. This means that although all curricular requirements for both degrees must be met, there is more freedom to use some courses in both programs.

6.3.2 AE-ME Double Major. All courses required for the AE-ME double major must be taken (see Table 5.5). ME324, ME341, ME442, AE201, AE301, AE401 and ME411 must be taken, in addition to the required AE courses.

All Year 1 and Year 2 courses, except AE200, are the same in both programs. ES330, ES340, and MA330 are required in both programs. AE201, AE301 and AE401 are equivalent to ME201, ME301 and ME401. AE431 doubles for ME326. AE450 and AE451 double for ME445 and ME446. (ME445 and ME446 may not double for AE450 and AE451.) The humanities, social science, and business elective requirements are the same for both programs.

¹ Article III-U paragraph 1.

The AE program contains two professional electives and one undesignated elective. ME411 would double as one professional elective. Any ME3XX or ME4XX course may be a professional elective in the AE program, except ME326 because it is similar to AE431.

The ME program contains three professional electives and two undesignated electives. Any AE3XX or AE4XX course, except AE431, AE450, and AE451 may be used as a professional elective in the ME program.

Any course, not duplicating material already taken in the AE or ME programs, may serve as an undesignated elective in those programs. AE201, AE301 and AE401 may not be used as an undesignated elective in the ME program. The same is true for ME201, ME301 and ME401 these may not be used as an undesignated elective in the AE program.

6.4 Engineering MBA-MS 4 + 1 Program

The Schools of Business and Engineering have an option which allows a freshman undergraduate engineer who wants an Master of Business Administration (MBA) or Master of Science (MS) in Management Systems to plan required courses so that the graduate degree can be completed at Clarkson in one year beyond the baccalaureate.

Students in this option will be in a double major (engineering and either MBA, or MS). They will be classified as engineering students with engineering advisors. Their admission to the MBA-MS program is conditional until they meet traditional School of Business admission requirements (GMAT's, etc.). Interested students should see the Director of School of Business Graduate Program.

6.5 Changing Majors

You may decide to change majors. This is accomplished by notifying the Department that you wish to enter and signing a "Change of Major" form (Appendix D) prepared by that Department.

6.6 Pre-PT

Mechanical Engineering undergraduates who are interested in Physical Therapy (PT) may complete the Pre-PT requirements by selecting a prescribed set of courses in this area. Details regarding the program and curriculum are in Appendix J.

7.0 Other Issues

7.1 AP and Off-Campus Work Credit

Advanced Placement Credit can be granted to you. See Student Administrative Services for further information and to get the credit transferred. It is best to do this as soon as possible in your freshman year.

Credit from another college or university is handled through the Student Administrative Services office. Before taking a course from another university, the Off-Campus Coursework Permission form must be filled out. (Appendix E)

7.2 Professional Engineering Exam

To obtain registration as a Professional Engineer (PE), you must first pass an examination called the Professional Engineering Exam. It is a two part exam. The first part is typically taken in the spring of the Senior year, and the second part is taken after having a certain number of years of work experience. Clarkson offers review sessions for first part of the exam. Notification for the review sessions will be in on the Daily Jolt. If you have any further questions, contact Eileen Winters, Wallace H. Coulter School of Engineering, 102 CAMP.

8.0 Career Planning

8.1 Career Development Center

Inventory your interests and build a career on the aspects of engineering that you enjoy. Talking to your advisor is a good way to see what is out in the work world. Many faculty have held industrial positions before entering teaching, or are working for industry or government as a researcher or consultant. Make contact with the staff of the Career Development Center in the ERC and find out what they can do for you. Also, attend the Career Fair held each fall. Many company representatives come to Clarkson for the fair and some of them are Clarkson graduates. It will be a good chance to speak to them about opportunities in the world today.

After discovering your interests, you may be in a better position to choose the electives in your curriculum.

8.2 Cooperative Education Program

The Cooperative Education Program (Co-op Program) is a good way to get practical experience by working in a company for one semester. To find out more about this program contact the Director of Co-op Education in the ERC.

Students must develop a plan for meeting their program's requirements and obtain written approval of this plan from the MAE department before leaving on Co-op (a form for this may be obtained from the office of the Director of Co-op Education). This plan must account for the scheduling of required courses and their prerequisites and for the proper sequencing of the capstone courses of the AE and ME programs. For AE majors to go on Co-op after the Fall semester of the junior year and for AE and ME majors to go on Co-op in the senior year, and still graduate at the end of eight regular semesters, is difficult. *Note that "Good Standing" status is required.*

8.3 Cross-registration

Clarkson has joined with Potsdam State, St. Lawrence University, and the Canton College of Technology in a program allowing a student to take up to two courses per year at the other institutions. Clarkson students typically use this opportunity to take language, art, education, or music courses not offered here. The Cross Registration Form is shown in Appendix G.

8.4 Undergraduate Research and Directed Study

Undergraduate students may participate in research projects with department faculty members, earning academic credit during the school year. In the summers, research projects are sometimes available at Clarkson or other universities. These usually pay a small stipend.

In a directed-study course, a student learns a subject by reading materials under the guidance of a faculty member, without lectures or other class activities. Both undergraduate research and directed study feature valuable one-on-one interactions with faculty members.

8.5 Study Abroad Program

Some students, usually in their Junior year, participate in exchange programs that Clarkson has with several universities in Sweden, England, Canada, Australia and New Zealand. To find out more details contact the Career and Professional Development Center in the ERC. The total number of credits transferred to Clarkson will not exceed 15. Prior to departure, an Off-Campus Coursework Permission form must be completed and approved for each course. In addition, students are required to meet with the MAE Executive Officer to seek his approval of the curriculum requirements and transfer credits. *“Good Standing” status is a requirement.* Exceptions to this requirement must be approved by the Mechanical and Aeronautical Engineering Department.

8.6 Student Academic Records

Your academic record is kept in the Mechanical and Aeronautical Engineering Office located in 253 CAMP. This record will be used to determine if you have met Clarkson’s graduation requirements. Students should also be aware of graduation requirements and should be making sure they are meeting these requirements.

9.0 Societies and Activities

There are professional and honor societies on campus that relate to the fields of Mechanical and Aeronautical Engineering. These societies may give further information about what types of jobs are available and what kind of work is presently being done in the field. To learn more about these organizations check the Student Activities office, or call the presidents of the organizations (their numbers are located in the Student Telephone Book).

9.1 Professional Societies

American Institute of Aeronautics and Astronautics (AIAA) [Prof. K. Visser/Prof. R. Jha/Prof. P. Marzocca]

American Society of Mechanical Engineers (ASME) [Prof. J. Moosbrugger]

Society Automotive Engineers (SAE) [Prof. J. Moosbrugger]

Society Women Engineers (SWE) [Prof. K. Issen]

The student chapters of these professional societies are very active sponsoring various events during the year including Open Houses, Parent's Weekend, several field trips, and a number of guest speakers. In addition, students have opportunities to participate in regional and national student conferences as well as leadership seminars. Various types of scholarships, awards, and loans are available through the local chapters of these societies. Student competitions are announced on a regular basis and students are always encouraged to participate in them. Call the faculty advisors (listed in brackets above) or the presidents of the student chapters to get more information about these activities.

9.2 Honor Societies

Pi Tau Sigma
Sigma Gamma Tau
Tau Beta Pi
Order of the Engineers

9.3 Activities

Clarkson's SPEED program also offers exciting extracurricular projects for students who are interested. The projects include:

Mini Baja. (Advisor: Professor Steven Yurgartis) Sponsored by the Society of Automotive Engineers (SAE), Mini Baja competition is a collegiate activity between student-built amphibious, all-terrain vehicles with approximately 45 entries, mainly from the eastern half of the United States.

Formula SAE. (Advisor: Professor John Moosbrugger) The formula SAE competition is a collegiate activity that challenges students from all over North America. The goal is to design, build, present, and race an open-wheel formula style car. The cars must be able to exhibit compliance in a technical inspection, tire test, and braking test.

Design, Build, and Fly. (Advisor: Professor Ken Visser) The annual Design, Build, and Fly (DBF) competition, sponsored by the American Institute of Aeronautics and Astronautics (AIAA), Cessna Aircraft Company and the Office of Naval Research (ONR), entails the design and construction of a radio-controlled, electric-powered model aircraft. The project provides a team of students interested in aeronautical design and construction the opportunity to produce a product to meet a specific set of mission requirements much as a commercial venture would produce a proposal based on the customer's needs.

If you would like more information about these vehicles, or would like to work on one of them, contact the faculty advisor or MAE Department.

9.4 Awards

The MAE Department honors several deserving students each year with the following awards. These awards are presented at University Recognition Day in April.

Mechanical and Aeronautical Engineering Staff Award. Awarded annually to the outstanding junior and the most promising senior in each program. The recipients are selected by the Mechanical and Aeronautical engineering faculty members based on scholastic performance and other activities.

The Norman L. Rea Award. This award is designed for a student of mechanical engineering or electrical engineering who, in four years at Clarkson, has shown the greatest development in personality as evidenced by the following attributes: poise, tact, cooperation, insight, self-expression and confidence.

Robert E. Rosati Award for Excellence in Mechanical Engineering. Awarded annually to the outstanding junior Mechanical Engineering student who demonstrates outstanding qualities

of professionalism, high scholastic achievement, humanity, and good citizenship and also exhibits outstanding potential for sustained achievement in an engineering career.

The James E. Fassett Memorial Scholarship is awarded to recognize and reward an outstanding junior mechanical engineering student. The recipient will be known as the James E. Fassett Scholar. (To qualify for this scholarship the student must meet specific requirements available at the Mechanical and Aeronautical Engineering Department office.)

In addition, endowed as well as Clarkson-sponsored scholarships are available.

10.0 Clarkson Services

10.1 Student Administrative Services Center (SAS)

The Student Administrative Services Center (SAS) combines the activities of the Bursar, Registrar and Financial Assistance offices and is located in the central area of Cubley-Reynolds and Ross-Brooks dormitory on the hill campus. This office is created to fulfill most administrative needs of students.

10.2 Student Development Center (SDC) and Community Affairs

The SDC is located on the second floor of Price Hall (Thomas House Entrance). It is composed of the service organizations discussed below.

10.2.1 Counseling Center.

This center offers counseling, workshops, and seminars. Topics for the workshops and seminars include time management, understanding your personality, long-distance relationships, stress control, alcohol and drug awareness, and dealing with shyness.

10.2.2 Student Support Services.

The services offered include peer tutoring, academic consulting, mini-courses, and workshops. Topics for these mini-courses and workshops are, dealing with test stress, reading improvement study skills, and academic enrichment topics.

10.2.3. Accommodative Services. This organization provides services for students with disabilities.

10.2.4. Foreign Student Advising. This service includes orientation and special advising for such topics as: visa, status requirements, and work regulations. (Attn: Tess Casler, 107 Snell Hall)

10.3 Local Activities

Potsdam offers many extracurricular activities. The Associated Colleges of the St. Lawrence

Valley publishes a calendar of "Special Events" every month. This and other local publications list lectures, concerts, seminars, club meetings, professional societies, sports, movies, etc. that are going on in the area.

11.0 References

Clarkson Catalog. You should have received a copy upon entering Clarkson. If not, you can pick up one from the Publications office on the first floor of Snell Hall.

Clarkson Regulations. The regulations that you follow are in the copy of the Clarkson Regulations that you received upon entering Clarkson University or at <http://www.clarkson.edu/studentaffairs/regulations>.

Clarkson University Courses. This compilation of course descriptions are available at **www.clarkson.edu/sas/master/index.html**.

Counseling Center Pamphlet. This pamphlet is available at the Counseling Center or various other places on campus such as the Information Desk (Cheel Campus Center).

Student Telephone Book. Your telephone book will be distributed to you in the fall.

12.0 Faculty

Ajit Achuthan

Assistant Professor
266 CAMP 268-4429

Ph.D., School of Aeronautics & Astronautics,
Purdue University

Research: Solid mechanics, smart materials and structures, nanomechanics.

Goodarz Ahmadi

Robert R. Hill '48, Professor & Dean of CSoE
102 CAMP 268-2322

Ph.D., Mechanical Engineering, Purdue University

Research: Random vibrations, turbulence modeling, multiphase flows and earthquake engineering.

Daryush K. Aidun

Professor & Dept. Chair
259 CAMP 268-6518

Ph.D., Materials Engineering, Rensselaer
Polytechnic Institute

Research: Weldability of Dissimilar Materials, Corrosion & Mech. Properties of Weldments and Reliability & Life Assessments of Eng. Systems.

Douglas Bohl

Assistant Professor
239 CAMP, 268-6683

Ph.D., Fluid Mechanics, Michigan State University

Research: Experimental fluid dynamics and optical diagnostics.

Frederick Carlson

Associate Professor
200 CAMP 268-6580

Ph.D., Mechanical Engineering,
University of Connecticut

Research: Computational fluid dynamics, heat and mass transfer.

Çetin Çetinkaya

Professor
241 CAMP 268-6514

Ph.D., Aeronautical & Astronautical Engineering,
University of Illinois

Research: Solid mechanics, stress wave propagation and stress localization in layered and composite structures, MEMS/Mechatronics,

Çetinkaya - Continued.

bioengineering.

Suresh Dhaniyala

Associate Professor
204 CAMP 268-6574

Ph.D., Mechanical Engineering University of
Minnesota

Research: Aerosol Physics, Aerosol Instrumentation and Fluid Mechanics.

Kevin Fite

Assistant Professor
206 CAMP 268-3809

Ph.D., Vanderbilt University

Research: Mechatronics and Prosthetic Device Design and Biomechanics

Brian Helenbrook

Associate Professor
357 CAMP 268-2204

Ph.D., Mechanical & Aeronautical Engineering,
Princeton University

Research: Numerical simulation, inter-facial flow, and combustion.

Kathleen Issen

Associate Professor
207 CAMP 268-3880

Ph.D., Theoretical & Applied Mechanics,
Northwestern University

Research: Solid mechanics, inelastic behavior, and failure of geomaterials.

Ratneshwar Jha

Associate Professor
364 CAMP 268-7686

Ph.D., Mechanical Engineering,
Arizona University

Ratneshwar Jha - Continued

Research: Solid mechanics, multidisciplinary optimization, smart materials, and composites.

James Kane

Associate Professor
208 CAMP 268-6587

Ph.D., Mechanical Engineering,

James Kane - Continued

University of Connecticut

Research: Structural and thermal analysis, engineering and computational mechanics, numerical methods, finite element and boundary methods, mechanical design, computer graphics, and design optimization.

Laurel Kuxhaus

Assistant Professor

227 CAMP 268-6602

Ph.D., Bioengineering, University of Pittsburgh

Research: Biomechanics of the upper extremity, orthopaedic injury, ergonomics and rehabilitation

Ronald LaFleur

Associate Professor

264 CAMP 268-3823

Ph.D., Mechanical Engineering,
University of Connecticut

Research: Fluid mechanics, heat transfer and design of fluid machinery components.

Piergiorgio Marzocca

Associate Professor

354 CAMP 268-3875

Ph.D., Dipartimento di Ingegneria Aeronautica and Aerospaziale, Politecnico di Torino, Turin, Italy

Research: Aeroelasticity, nonlinear dynamics and Control

John Moosbrugger

Professor & Associate Dean CSoE

102 CAMP 268-6532

Ph.D., Mechanical Engineering,
Georgia Institute of Technology

Research: Plasticity, viscoplasticity, and experimental mechanics.

David Morrison

Associate Professor

205 CAMP 268-6585

Ph.D., Materials Science & Engineering,
The University of Michigan

Research: Metallurgy, fracture mechanics, fatigue, cyclic plasticity and surface modification processes.

Daniel Valentine

Associate Professor & Executive Officer

362 CAMP 268-2204

Ph.D., Fluid Mechanics,

The Catholic University of America

Research: Buoyancy induced flows, computational fluid mechanics and marine hydrodynamics.

Kenneth Visser

Associate Professor

361 CAMP 268-7687

Ph.D., Aerospace Engineering,
University of Notre Dame

Research: Experimental aerodynamics, flow visualization techniques, vortex flows.

Kenneth Willmert

Professor

367 CAMP 268-2323

Ph.D., Mechanical Engineering,
Case Western Reserve University

Research: Computer aided design of mechanical and structural systems and the application of computer graphics in engineering analysis and design.

Philip A. Yuya

Assistant Professor

203 CAMP 268-2205

Ph.D., Engineering Mechanics, University of Nebraska-Lincoln

Research: Constitutive modeling and experimental mechanics of materials with special emphasis on biomaterials, nanofibers and polymers

Steven Yurgartis

Associate Professor

249 CAMP 268-6575

Ph.D., Materials Engineering,
Rensselaer Polytechnic Institute

Research: Mechanical properties of polymers, polymer-based composites, and carbon/carbon composites.

Staff

Tina Shatraw

Administrative Secretary
253 CAMP 268-6588

Rhonda Sharpe

Administrative Secretary
257 CAMP 268-6586

13.0 Affirmative Action Equal Opportunity Policy

Clarkson University does not discriminate on the basis of race, gender, color, creed, religion, national origin, age, disability, sexual orientation, veteran or marital status in provision of educational opportunity or employment opportunities. This policy prohibiting discrimination on the basis of sexual orientation does not apply to the University's relationships with outside organizations, including the federal government, the military, ROTC, and private Employers.

Clarkson University does not discriminate on the basis of sex or disability in its educational programs and activities, pursuant to the requirements of Title IX of the Educational Amendments of 1972, and Section 504 of the Rehabilitation Act of 1973, and the American Disabilities Act of 1990 respectively. This policy extends to both employment by and admission to the University. Inquiries concerning Section 504, and the Americans with Disabilities Act of 1990 should be directed to the Section 504/ADA Coordinator, Room 224, Prince Hall, Clarkson University, PO Box 5645, Potsdam, NY 13699-5645; or telephone 315-268-2327. Inquiries concerning Title IX, the Age Discrimination Act, or other discrimination concerns should be directed to the Title IX Coordinator, Office of Affirmative Action, Room 124, Snell Hall, Clarkson University, PO Box 5542, Potsdam, NY 13699-5542; or telephone 315-268-2362. Information on the processing of grievances and charges relating to the above policies can be obtained from the Office of Affirmative Action.

Clarkson University is making a special effort to identify for employment opportunities and participation in its educational programs a broad spectrum of candidates including women, minorities and people with disabilities.



UNDERGRADUATE DUAL DEGREE*

DECLARATION FORM

STUDENT ADMINISTRATIVE SERVICES

PO BOX 5575

POTSDAM, NY 13699-5575

P. 315-268-6451 · F. 315-268-2321

[HTTP://WWW.CLARKSON.EDU/SAS/FORMS/DUALDEGREEFILLABLE.PDF](http://www.clarkson.edu/sas/forms/dualdegreefillable.pdf)

Student Name _____ Student Number _____

Clarkson University Local Box _____ Local Phone _____

In addition to my degree in _____

I request that I be registered for a dual degree in _____

I UNDERSTAND THAT:

1. I must satisfy all degree requirements for at least two different Clarkson bachelor's degree programs.
2. I have a primary responsibility to complete the degree requirements in the first named degree or to reverse the priority by completing a Change of Major form.
3. I must have a minimum of 150 credit hours, including at least 30 credit hours unique to each program. See *Clarkson Regulations*, section III-T Double Majors and Second Clarkson Degrees.
4. The relevant academic deans, in consultation with the department heads or directors of the degree programs, must judge that the two degree programs establish competencies in two essentially different areas.

If I decide to drop my second degree program, I will inform Student Administrative Services in writing by signing the bottom of this form.

Student Signature

Date

Acknowledgement/Approval

Acknowledged: _____
Chair/Director, First Degree Department *Date*

First Degree Advisor's Name: _____

Approved: _____
Chair/Director, Second Degree Department *Date*

Second Degree Advisor's Name: _____

For SAS Use Only - Distribution:

- ☐ Chair/Director, First Degree Department
- ☐ Chair/Director, Second Degree Department
- ☐ Student
- ☐ Financial Aid

I would like to drop my degree in:

Student Signature

Date

* A dual degree is the simultaneous awarding of two Clarkson bachelor's degrees at one Commencement.

3/25/08 (p)

APPENDIX A



UNDERGRADUATE DOUBLE MAJOR*

DECLARATION FORM

STUDENT ADMINISTRATIVE SERVICES

PO BOX 5575

POTSDAM, NY 13699-5575

P. 315-268-6451 · F. 315-268-2321

[HTTP://WWW.CLARKSON.EDU/SAS/FORMS/DOUBLEMAJORFILLABLE.PDF](http://www.clarkson.edu/sas/forms/doublemajorfillable.pdf)

Student
Name

Student Number

Clarkson University Local
Box

Local Phone

In addition to my first major in

I request that I be registered for an additional major in

☐ Check here if you are in the Areté program

I UNDERSTAND THAT:

I have responsibility to enroll in courses appropriate for degree requirements in each major and that to do so I must meet regularly with advisors in both majors. I have a primary responsibility to complete the degree requirements in the first named major or to reverse the priority by completing a Change of Major form.

I further understand that the University has no responsibility to offer or schedule courses in order to assure the achievement of the second named major. If I decide to drop my second major, I will inform Student Administrative Services in writing by signing the bottom of this form.

Student Signature

Date

Acknowledgement/Approval

Acknowledged:

Chair/Director, First Major Department

Date

First Major Advisor's Name:

Approved:

Chair/Director, Second Major Department

Date

Second Major Advisor's Name:

Distribution:

- ☐ Chair/Director, First Major Department
- ☐ Chair/Director, Second Major Department
- ☐ Student
- ☐ Financial Aid

For SAS Use Only:

I would like to drop my major in:

Student Signature

Date

* A double major is a single degree awarded when a student satisfies all curricular requirements for two Clarkson bachelor's degree programs but does not qualify for a second degree or a dual degree. That is, both sets of curriculum requirements must be completed prior to awarding the degree. Graduation marks the completion of all degree requirements. 3/25/08

APPENDIX B



**UNDERGRADUATE MINOR
DECLARATION FORM**
STUDENT ADMINISTRATIVE SERVICES
PO BOX 5575
POTSDAM, NY 13699-5575
P. 315-268-6451 · F. 315-268-2321
<http://www.clarkson.edu/sas/forms/minorformfillable.pdf>

Student Name _____ Student Number _____

Clarkson University Local Box _____ Local Phone _____

In addition to my major in _____

and second major (if applicable) in _____

I request that I be registered for a minor in _____

I UNDERSTAND THAT the University has no responsibility to offer or schedule courses in order to assure the achievement of the minor. If I decide to drop my minor, I will inform Student Administrative Services in writing by signing the bottom of this form. Further, I understand that all requirements for the completion of the minor must be complete by the time of graduation from Clarkson University in order to be a registered part of my degree program.

Student Signature

Date

Acknowledgement/Approval

Approved: _____
Chair/Director, First Major Department

Date

First Major Advisor's Name: _____

Approved: _____
Chair/Director, Second Major Department if applicable

Date

Second Major Advisor's Name: _____

Approved: _____
Chair/Director, Minor Department

Date

For SAS Use Only – Distribution:

- ☐ Chair/Director, First Major
☐ Chair/Director, Second Major (if applicable)
☐ Chair/Director, Minor
☐ Student

I wish to drop my minor in:

Student Signature

Date

3/20/2008 (g)

APPENDIX C



UNDERGRADUATE CHANGE OF MAJOR FORM

STUDENT ADMINISTRATIVE SERVICES

PO BOX 5575

POTSDAM, NY 13699-5575

P. 315-268-6451 · F. 315-268-2321

[HTTP://WWW.CLARKSON.EDU/SAS/FORMS/CHANGEMAJORFILLABLE.PDF](http://www.clarkson.edu/sas/forms/changemajorfillable.pdf)

*Student to complete **Part A**; New Major Department to complete **Part B***

PART A

Student Name _____ Student Number _____

Clarkson University Local Box _____ Local Phone _____

I would like to change my major

FROM: _____ **To:** _____

☐ Check here if you are in the Areté program

☐ Check here if you are a double major / dual degree student reversing the priority of your two programs

*Students wishing to **add** a second major or dual degree need to complete a Double Major or Dual Degree Form, as appropriate, available at departmental offices, Student Administrative Services, or online at www.clarkson.edu/sas/forms.*

My Anticipated Graduation Date is: ☐ May 20 _____ ☐ December 20 _____

PART B

1. Specific directions (if any) concerning courses *not* to be used toward meeting graduation requirements *and* the semester during which they were taken (use back of sheet if necessary):
2. Other conditions, if any:
3. The student's Academic Advisor will be: _____

Students should be advised of any necessary modifications to their course schedule. These changes should be completed by the student on PeopleSoft, or if this is not possible, on an add/drop form submitted to Student Administrative Services, CU Box 5575 will all appropriate approvals.

Acknowledgement/Approvals

Acknowledged: _____
Student Signature Date

Approved: _____
Chair/Director, New Major Department Date

SAS Use Only - Distribution:

- ☐ Chair/Director, New Major Department
- ☐ Chair/Director, Previous Major Department
- ☐ Student
- ☐ Financial Aid

5/20/08 (B) **APPENDIX D**



OFF-CAMPUS COURSEWORK PERMISSION FORM

STUDENT ADMINISTRATIVE SERVICES

PO BOX 5575

POTSDAM, NY 13699-5575

P. 315-268-6451 · F. 315-268-2321

1. STUDENT INFORMATION:

Name: _____ Student Number: _____

Class Year: _____ Local Phone: _____

Campus Box: _____ Major(s): 1. _____
or home address _____ 2. _____

2. OFF-CAMPUS COURSE INFORMATION:

College you will be attending: _____

Course name and number: _____
Catalog Listing (ex. SOC 101) Title (ex. Intro to Sociology)
Semester Hours

Number of credits: _____ Or _____ Quarter Hours (see note 1 on reverse)

Semester course will be taken: ☐ Spring ☐ Summer ☐ Fall ☐ Winterterm Year _____
Course description **must** be attached

3. COMPARABLE CLARKSON COURSE:

Course: _____
Subject and catalog number (Example: MA 132)

Credits: _____ semester hours

List Knowledge Area (if appropriate): _____
CGI, CSO, EC, IA, IG, STS, UNIV

Is this a replacement course for a course taken previously at Clarkson University?

☐ Yes ☐ No

If Yes, list the course it is replacing:

NOTE: May only replace grades of **D+ , D, or F.**

See note 2 on reverse regarding the transfer of communication points

4. APPROVALS / SIGNATURES:

Regardless of any approvals on this form, per Clarkson University Regulation III-U Graduation, only a student who is within 6 credit hours of graduating may **complete** their undergraduate degree off campus.

Student Signature _____

Course Department Chair* _____

First Academic Advisor (or Dept. Chair*) _____

Second Academic Advisor (or Dept. Chair*) _____
if applicable

**For Clarkson's School of Business, forms should be submitted to the Dean's office for course or advisor approval.*

SAS USE ONLY:

☐ Form Logged
☐ Credit posted, date: _____

DISTRIBUTION:

☐ Student
☐ Student's Major Department(s)

APPENDIX E

INSTRUCTIONS

This form must be completed before taking a course at another college or university, to assure transfer of appropriate credit to Clarkson University. Follow the instructions below:

1. Obtain information about the course you plan to take; this should include the course description. Course syllabus and textbook information may also be helpful in evaluation of the course.
2. Complete parts 1 and 2 on the front of this form. Be sure to check the appropriate box to indicate if this course is a repeat course (a course you have taken previously).
3. Complete part 3 if you know the Clarkson course equivalent of the off-campus course. If not, leave it blank for the course department chair to determine, upon review of the off-campus course description and materials. This section ***must be complete*** before turning in to SAS.
4. You and your advisor should sign the form, and then take it to the department that would offer a similar course at Clarkson for approval. If you do not know which department to take the form to, bring it to Student Administrative Services, or call 268-6451 for assistance.
5. **Request an official transcript from the registrar of the college or university attended.** It should be sent to Student Administrative Services, Clarkson University, Box 5575, Potsdam, NY 13699-5575. A copy of the completed form will be mailed to the student's address listed on the front of this form once transfer credit has been posted.

NOTES:

1. Some schools use the quarter system. A 3-credit course taken at such schools is ***not transferable as 3 semester hours to Clarkson***, which uses the semester system. To obtain 3 transfer credits at Clarkson, the quarter system course must be at least 4 credit hours.
2. Communication Points will only be awarded after a review of the course syllabus that demonstrates sufficient communication content to warrant such a designation.

MP COURSE APPROVAL FORM

Date: _____

Student Name

Student Number

has permission to use MP _____ (three credits) as an

Undesignated Elective:

Instructor

Academic Advisor

Or as a

Professional Elective:

Instructor

Academic Advisor

and may use this course to meet the graduation requirements.

Chairman/Executive Officer

Approved for MAE Department.



Cross-Registration Form

Acceptance of this registration is contingent upon satisfaction of the regulations of the Associated Colleges and individual institutions.

Student Information

Student ID No. _____ Name (Last, First, MI.) _____

Local Address _____ Student's Email _____

Local Telephone _____ - _____ Birthdate ____/____/____ Social Security No. _____
(If different from Student ID #)

I am: ☐ Public school personnel with transcripts held at: ☐ St. Lawrence ☐ Potsdam

☐ A full-time matriculated undergraduate student at: ☐ Clarkson ☐ St. Lawrence ☐ Canton ☐ Potsdam

☐ A full-time matriculated graduate student at: ☐ Clarkson ☐ St. Lawrence ☐ Canton ☐ Potsdam

☐ A faculty/staff member at: ☐ Clarkson ☐ St. Lawrence ☐ Canton ☐ Potsdam ☐ Associated Colleges

My transcripts are held at: ☐ Clarkson ☐ St. Lawrence ☐ Canton ☐ Potsdam

If faculty/staff, are you matriculated? ☐ Yes ☐ No

REGISTRATION IS ON A SPACE AVAILABLE BASIS ONLY

Course Information (One course per form)

I am cross-registering to: ☐ Clarkson ☐ St. Lawrence ☐ Canton ☐ Potsdam
Last semester I was a student at: ☐ Clarkson ☐ St. Lawrence ☐ Canton ☐ Potsdam

I am registering for:

Semester	Year
Fall	_____
Spring	_____
Summer	_____

Course Dept. & Number _____ Course Name _____

Section Number _____ Days & Times _____ Credit Hours _____

If you are Cross-Registered as part of one of the following programs, please indicate which:

3-2 Engineering: Clarkson/Potsdam ☐

Clarkson/St. Lawrence ☐

2+2 Engineering: Clarkson/Canton ☐

4+1 MBA: Potsdam/Clarkson ☐

Clarkson/St. Lawrence ☐

N-6 Certification: St. Lawrence/Potsdam ☐

Art Certification: Potsdam/St. Lawrence ☐

Authorization

Student's Signature _____

Date _____

Advisor's or Dept. Chair's Signature
(For students matriculated at SLU, both are required)

Print Instructor's Name _____

Date _____

Dean of Graduate Students (if needed)

Instructor's Signature _____

Date _____

Print Instructor's E-mail _____

RETURN ALL COPIES PROMPTLY TO YOUR REGISTRAR

APPENDIX G

Cross-registration is open only to full-time matriculated undergraduate and Graduate students and full time staff members within the member institutions of the Associated Colleges of the St. Lawrence Valley.

Eligible student and staff may register for a maximum of two (2) courses per Academic year. Exceptions to this limitation may be made by the institution offering the course.

Instructions

1. After a student has identified courses for which he/she wishes to cross-register, the student must obtain the signed approval of his/her program advisor. Students matriculated at St. Lawrence University must also obtain the signature of the appropriate chairperson. This ensures that the course satisfies the student's program and credit-hour requirements and that the course is unavailable at the home campus.
2. Next, the student must obtain the signature of the instructor of the course to ensure that space is available and that all prerequisites are met. **CROSS-REGISTERED STUDENTS ARE ADMITTED TO A COURSE ON A SPACE AVAILABLE BASIS ONLY.**
3. Graduate students must also obtain the signed approval of the Dean of Graduate Studies of the school offering the course.
4. All copies of the completed form must be returned to the Registrar of the institution at which the student is officially enrolled or employed.
5. In general, the institutions in the consortium schedule different starting and ending dates and vacations. The student is responsible for arranging to keep up with course work despite calendar disjunctions, and, in some cases, must arrange for food and lodging when dormitories on the home campus are closed.
6. Students must adhere to their home school's policies for incompletes, withdrawals, pass/fail or adding or dropping a cross-registered class.

*Please check the full description of Cross-Registration regulations and procedures, available from the Registrars' offices or Associated Colleges, Merritt Hall, SUNY Potsdam.

Distribution of copies:

WHITE – Home Institution YELLOW – Associated Colleges PINK – Host Institution GOLDENROD- Retained by student

Clarkson University
Department of Mechanical and Aeronautical Engineering

Professional Concentration in Manufacturing Engineering

In addition to my present major in Mechanical and Aeronautical Engineering, I request enrollment in the Professional Concentration in Manufacturing Engineering.

I understand that the University has no responsibility to offer courses or schedule courses in order to assure the achievement of the Professional Concentration in Manufacturing Engineering.

Student Name

Student Number

Student Signature

Date

CC:

APPENDIX H

Clarkson University
Department of Mechanical and Aeronautical Engineering

Professional Concentration in Materials Engineering

In addition to my present major in Mechanical and Aeronautical Engineering, I request enrollment in the Professional Concentration in Materials Engineering.

I understand that the University has no responsibility to offer courses or schedule courses in order to assure the achievement of the Professional Concentration in Manufacturing Engineering.

Student Name

Student Number

Student Signature

Date

CC: Don Rasmussen

Clarkson University
Department of Mechanical and Aeronautical Engineering

Professional Concentration in Biomedical and Rehabilitation Engineering

In addition to my present major in Mechanical Engineering, I request enrollment in the Professional Concentration in Biomedical and Rehabilitation Engineering

I understand that the University has no responsibility to offer courses or schedule courses in order to assure the achievement of the Professional Concentration in Biomedical and Rehabilitation Engineering.

Student Name

Student Number

Student Signature

Date

CC: Kevin Fite (MAE)
Stephanie Schuckers & Charlie Robinson (ECE)
Ian Suni (CHEM/Biomol Eng)

APPENDIX J

Clarkson University
CENTER FOR HEALTH SCIENCES
DEPARTMENT OF PHYSICAL THERAPY

PRE-PHYSICAL THERAPY CURRICULUM SHEET

Student _____ ID _____

Class _____ Major _____ Phone _____ Box _____

Major Advisor _____ PT Advisor _____

COURSE NO.	COURSE TITLE	CR	GRADE	Notes
BY160 (required) and BY162 (required)	Cellular and Molecular Biology and Cellular and Molecular Biology Lab	3 2		
BY360 and BY362 Or BY350 BY352	Physiology (preferred) and Physiology Lab Or Comparative Anatomy (2 nd choice) and Comparative Anatomy Lab	3 1 3 1		
CM103 and CM105 Or CM131	Structure and Bonding and Structure and Bonding Lab Or General Chemistry I with Lab	3 2 4		
CM104 and CM106 Or CM132	Chemical Equilibrium and Dynamics and Equilibrium and Dynamics Lab Or General Chemistry II with Lab	3 2 4		
PH131 Or PH141	Physics I with Lab Or Physics for Life Sciences I with Lab	4 4		
PH132 Or PH142	Physics II with Lab Or Physics for Life Science II with Lab	4 4		
PT102 (Spring)	Intro to Healthcare	2		
PT201 (Fall)	Healthcare System	2		
PT301 (Fall)	Scientific and Ethical Basis of Health Care	2		
Math Elective	Math course required by major department	3		
STAT282 Or STAT383 Or SB284	General Statistics Or Applied Statistics I Or Statistics	3 3 3		
PY151	General Psychology	3		
PY462 (Fall) Or PY463 (Fall)	Abnormal Psychology Or Health Psychology	3 3		
PY370 (Spring odd years)	Developmental Psychology	3		

SEMESTERS INDICATED FOR COURSE OFFERINGS MAY CHANGE

STUDENT MUST VERIFY IF COURSE IS OFFERED IN SEMESTER INDICATED/DESIRED.

CU PT/04-02-07/f:\Clarkson\admissions\PrePTCurricSheet040207

APPENDIX K

HONORS COURSE APPROVAL FORM

Date: _____

Student Name

Student Number

I request permission to use my Honors Thesis (HP490 series) _____
Title

Description

_____ as a Professional Elective.
Thesis advisor

Chairman/Executive Officer
Approved for MAE Department

APPENDIX L

PROFESSIONAL EXPERIENCE REQUIREMENT **in the** **Wallace H. Coulter School of Engineering**

The Professional Experience requirement of the Clarkson Common Experience curriculum is the following:
“All students participate in a project-based professional experience such as co-op, internship, directed research, or community project clearly related to the student’s professional goals.”

Engineering majors can fulfill this requirement by one of the following:

- a) A meaningful professional experience, such as an internship in industry or a government facility, among others. This would typically take place during the summer, but could be a semester co-op assignment.
- b) Participation in an independent research project under the direction of a qualified mentor. This could be at Clarkson or elsewhere, could be a summer experience or during the academic year, could be for pay or for course credit (or both).
- c) Serving as a leader or taking on a role with significant responsibility in a professional or community service organization or in another volunteer activity.
- d) Taking on a role with significant responsibility in an appropriate team project. This could be a competition project such as those that fall under the SPEED program, or experience in a capstone design course or course sequence that provides a project-based experience meeting the objectives of the Professional Experience,[†] among others.
- e) Any other activity or collection of activities where a student can demonstrate that she or he has met the objectives of the Professional Experience[†] Requirement

ES 499 Professional Experience for Engineering Majors, a 0 credit pass/no entry course is used to matriculate the Professional Experience requirement. Students will typically enroll in ES499 during the junior or senior years. Pre-approval (using the PRE-APPROVAL WORKSHEET for the PROFESSIONAL EXPERIENCE Requirement in the Wallace H. Coulter School of Engineering) is required before enrollment in ES499. Approval of the Post-Experience Self Assessment is required to receive credit for ES499. If a student has not passed the course during the fall semester, s/he will again register for the course during the following spring semester. Junior standing is required for enrollment in ES499.

Planning for completion of this requirement should start as early as possible and it should be discussed between the student and the student’s academic advisor. A plan for completing ES499 should be completed using the WORKSHEET for the PROFESSIONAL EXPERIENCE Requirement in the Wallace H. Coulter School of Engineering (available on the web and in department offices). This must be submitted for the recommendation of the academic advisor before the end of spring semester of the junior year. This form will require each student to explain how s/he plans to complete ES499 and must provide relevant contact information¹. It must be approved by the department chair/area coordinator for the major.

It is the student’s responsibility to demonstrate to the program administration responsible for the student’s major that the student has fulfilled the objectives of the Professional Experience Requirement.[†] Students will document their activity/activities using the COMPLETION WORKSHEET and the POST EXPERIENCE SELF ASSESSMENT for the PROFESSIONAL EXPERIENCE Requirement in the Wallace H. Coulter School of Engineering. This will be evaluated for recommendation by the student’s academic advisor and for approval by the department chair/area coordinator for the major. The time when a student has his or her meaningful professional experience could be anytime beyond the freshman year. However, students are encouraged to use experience gained towards the end of their studies to fulfill this requirement.

† Professional Experience Objectives

Students should develop an appreciation of the need for self-motivated life-long learning:

1. Students should understand the need for continuously updating their professional skills after graduation.
2. Students should demonstrate learning effectively on their own.

Students should develop an increased social awareness and interpersonal competence:

3. Students should demonstrate leadership skills such as goal setting, change management, ethical behavior, and providing actionable feedback,
4. Students should demonstrate teamwork skills such as building effective relationships with peers, being a collaborative team member, and identifying and managing team conflict,
5. Students should demonstrate an understanding of the value of service to the University, to the community, or to the profession.

PRE-APPROVAL* WORKSHEET
for the
PROFESSIONAL EXPERIENCE Requirement
in the
Wallace H. Coulter School of Engineering

Name: _____ **Student No.** _____ **Date:** _____

My project-based professional experience is: (ONLY ONE IS REQUIRED)

_____ **professional experience with** _____
Company Name, Location, Contact Person**

_____ **directed research with** _____
Research Supervisor**, Location

_____ **community/service project with** _____
Project Supervisor**, Location

_____ **team project experience** _____
Explain, Contact Person**

_____ **other project-based experience** _____
Explain, Contact Person**

Expected Start Date: _____ **Expected End Date:** _____

Provide a brief description of the proposed project.

	Recommended	Not Recommended	Date
Advisor	_____	_____	_____
	Approved	Not Approved	Date
Department Chair/ Area Coordinator	_____	_____	_____

*pre-approval is required for registration in ES499 Professional Experience for Engineering Majors

** Refers to a responsible representative of the institution, company or organization that can be contacted to verify the experience. Contact information should include: Mailing address, e-mail address, and telephone number.

Provide a description of the specific learning objectives (see the [†]**Professional Experience Objectives**) you hope to attain this experience, including specific knowledge, skills and competencies. During your experience, look out for and record the following:

1. Instances where you see co-workers continuously updating their professional skills (training, professional development, mentoring, etc.). Why is this important?
2. Instances where you were required to learn new knowledge and/or skills effectively on your own. What was this experience like? Why is this important?
3. Examples of leadership skills including, to the extent possible: goal setting, change management, ethical behavior, and providing actionable feedback. Describe each of these and discuss your reactions to seeing these occur in the workplace. What happened? What were the results of these actions? How can you incorporate what you saw with your managerial style?
4. Examples where you built teamwork skills such as building effective relationships with peers, being a collaborative team member, and identifying and managing team conflict. What were the differences and similarities of these team experiences in comparison to what you have seen in school?
5. Examples of here you observed co-workers providing service to the University, to the community, or to the profession. What were the costs and benefits of the service activities you observed?

COMPLETION WORKSHEET
for the
PROFESSIONAL EXPERIENCE Requirement
in the
Wallace H. Coulter School of Engineering

Name: _____ **Student No.** _____ **Date:** _____

My project-based professional experience was: (CHECK ONLY ONE)

_____ **professional experience with** _____
Company Name, Location, Contact Person*

_____ **directed research with** _____
Research Supervisor*, Location

_____ **community/service project with** _____
Project Supervisor*, Location

_____ **team project experience** _____
Explain, Contact Person*

_____ **other project-based experience** _____
Explain, Contact Person*

Start Date: _____

End Date: _____

Provide a brief description of the project or work assignment you undertook during the time period noted above.

Student signature _____

**Contact Person/
Supervisor signature** _____

* Refers to a responsible representative of the institution, company or organization that can be contacted to verify the experience. Contact information should include: Mailing address, e-mail address, and telephone number.

POST-EXPERIENCE SELF ASSESSMENT**
for the
PROFESSIONAL EXPERIENCE Requirement
in the
Wallace H. Coulter School of Engineering

Experience Description. Give a brief summary of your project experience.

Self-Learning. Based on your project experience, give examples of concepts you learned on your own. Why do you think it is important to maintain your professional skills after graduation?

Leadership. Based on your project experience, give examples of leadership skills you used such as goal setting, change management, ethical behavior, and providing actionable feedback.

Teamwork. Based on your project experience, give examples of working with others in a collaborative environment; give examples of your contributions to team efforts; if possible, give examples of identifying and managing team conflict.

Service. Based on your experience, state why it is important to provide service to the University, to the community, or to the profession.

Project Site Evaluation. Rate the project site according to the following:

Based on my experience, I would recommend the project site to another student.

Strongly Disagree_____ Disagree_____ Agree_____ Strongly Agree_____

Provide additional comments below:

	Recommended	Not Recommended	Date
Advisor	_____	_____	_____
	Approved	Not Approved	Date
Department Chair/ Area Coordinator	_____	_____	_____

****** Approval of Post-Experience Self Assessment is required to receive credit for ES499 Professional Experience for Engineering Majors