STATE UNIVERSITY OF NEW YORK
COLLEGE OF TECHNOLOGY
CANTON, NEW YORK

MASTER SYLLABUS

CITA 380 – Integrated Programming for Engineers

Created by: Tatsuhito Koya, Ph.D.
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CANINO SCHOOL OF ENGINEERING TECHNOLOGY
ENGINEERING SCIENCE
FALL 2018

A. TITLE: Integrated Programming for Engineers

B. COURSE NUMBER: CITA 380

C. CREDIT HOURS: (Hours of Lecture, Laboratory, Recitation, Tutorial, Activity)

 # Credit Hours: 3
 # Lecture Hours: 2 **per week**
 # Lab Hours: **per week**
Other: 2 hours recitation **per week**

Course Length: 15 **Weeks**

D. WRITING INTENSIVE COURSE: No

E. GER CATEGORY: None

F. SEMESTER(S) OFFERED: Spring

G. COURSE DESCRIPTION: This course develops methodologies and techniques for program creation and implementation to solve mathematical and engineering problems. The students will be exposed to solving mathematical problems such as simultaneous equations and to performing engineering data acquisition from local sources as well as remote sources using high-level programming languages, scripting languages, and commercial off-the-shell products such as MATLAB.

H. % PRE-REQUISITES/CO-REQUISITES:

a. Pre-requisite(s): CITA 220, ENGS 203, MATH 263
b. Co-requisite(s): None
c. Pre- or co-requisite(s): None

I. % STUDENT LEARNING OUTCOMES:

Course Student Learning Outcome [SLO]	***PSLO***	***ISLO***
a. Translate and solve mathematical and engineering problems into computer programs	1. Ability to apply mathematics, science and engineering principles.	2 [CA] 5
b. Test, debug, and validate programs.	2. Ability to design and conduct experiments, analyze and interpret data	2 [CA] 5
c. Create programs that produce and consume resources on networks	3. Ability to design a system, component, or process to meet desired needs.	2 [CA] 5
d. Create programs that store, retrieve, and manipulate data in databases	3. Ability to design a system, component, or process to meet desired needs.	2 [CA] 5
e. Create programs to control hardware	3. Ability to design a system, component,	2 [CA] 5

	or process to meet desired needs.	
f. Document programs and create reports	7. Ability to communicate effectively.	1 [O] 5

J. APPLIED LEARNING COMPONENT: Yes X No

K. TEXTS: Bradley, Aaron R. Programming for Engineers. Berlin: Springer, 2011. Print.

L. REFERENCES: Kernighan, Brian W, and Dennis M Ritchie. The C Programming Language. Englewood Cliffs, N.J.: Prentice Hall, 1988. Print.

M. EQUIPMENT: Computer lab

N. GRADING METHOD: A-F

O. SUGGESTED MEASUREMENT CRITERIA/METHODS:

- Exams
- Quizzes
- Assignments
- Participation

P. DETAILED COURSE OUTLINE:

I. Solving Engineering and Mathematical Problems
  A. Solving Mathematical Problems
    a. Gaussian Elimination
    b. Differential Equation
    c. Numerical Integration
  B. Solving Engineering Problems Using Variational Methods
    a. Ritz Method
    b. Galerkin Method

II. Creating Network Data Acquisition Programs
  A. Creating Network Client Programs for Different Media
    a. Ethernet
    b. Serial
  B. Creating TCP /IP Client
    a. Web Client
    b. FTP Client
  C. Controlling UDP/IP Client
    a. tftp Client
  D. Other Industrial Communication Standards
    a. OPC
    b. MODBUS

Q. LABORATORY OUTLINE: N/A !