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



MASTER SYLLABUS

ENGS 102 – Programming for Engineers

For available course numbers, contact the Registrar's Office at registrar@canton.edu

CIP Code: 15.08

For assistance determining CIP Code, please refer to this webpage <u>https://nces.ed.gov/ipeds/cipcode/browse.aspx?y=55</u> or reach out to Sarah Todd at <u>todds@canton.edu</u>

Created by: Dr. Lucas Craig Updated by:

> School: Canino School of Engineering Department: Engineering Science Implementation Semester/Year: Fall 2025

A. TITLE: Programming for Engineers

B. COURSE NUMBER: ENGS 102

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

# Credit Hours per Week	2
# Lecture Hours per Week	
# Lab Hours per Week	4
Other per Week	

D. WRITING INTENSIVE COURSE:

Yes	
No	Х

E. GER CATEGORY:

Does course satisfy a GER category(ies)? If so, please select all that apply.

[1-2] Communication	
[3] Diversity: Equity, Inclusion & Social Justice	
[4] Mathematics & Quantitative Reasoning	
[5] Natural Science & Scientific Reasoning	
[6] Humanities	
[7] Social Sciences	
[8] Arts	
[9] US History & Civic Engagement	
[10] World History & Global Awareness	
[11] World Languages	

F. SEMESTER(S) OFFERED:

Fall	
Spring	
Fall and Spring	х

G. COURSE DESCRIPTION:

This course introduces computer programming using equation solving software. Students will learn the skills necessary to create predictive models and solve basic engineering problems as well as methods for graphically presenting results and data using said software. The skills taught will assist in the analysis of engineering problems in more advanced course work.

H. PRE-REQUISITES: MATH 161, CO-REQUISITES: PHYS 121 or PHYS 131

I. STUDENT LEARNING OUTCOMES:

Course Student Learning Outcome [SLO]	Program Student Learning Outcome [PSLO]	GER	ISLO & Subsets	
a. Develop simple predictive models using equation solving software	SO 1		2-Crit Think 5-Ind, Prof, Disc, Know Skills	PS
b. Illustrate data through2D and 3D plots	SO 1 and 3		1-Comm Skills 5-Ind, Prof, Disc, Know Skills	W
c. Demonstrate the use of control structures in programming	SO 1		2-Crit Think 5-Ind, Prof, Disc, Know Skills	PS
d . Recognize the correct use of string vs. numerical data	SO 1		2-Crit Think	СА
e. Apply programming to engineering problems	SO 1 and 3		2-Crit Think 5-Ind, Prof, Disc, Know Skills	PS

KEY	Institutional Student Learning Outcomes
	[ISLO 1 – 5]
ISLO #	ISLO & Subsets
1	Communication Skills
	Oral [O], Written [W]
2	Critical Thinking
	Critical Analysis [CA], Inquiry & Analysis [IA] , Problem Solving [PS]
3	Foundational Skills
	Information Management [IM], Quantitative Lit, /Reasoning [QTR]
4	Social Responsibility
	Ethical Reasoning [ER], Global Learning [GL],
	Intercultural Knowledge [IK], Teamwork [T]
5	Industry, Professional, Discipline Specific Knowledge and Skills

J. APPLIED LEARNING COMPONENT:

Yes	х
No	

If yes, select [X] one or more of the following categories:

Classroom / Lab	х	Community Service	
Internship		Civic Engagement	
Clinical Practicum		Creative Works/Senior Project	
Practicum		Research	
Service Learning		Entrepreneurship [program, class, project]	

K. TEXTS: None

- L. REFERENCES: None
- M. EQUIPMENT: None
- N. GRADING METHOD: A-F

0. SUGGESTED MEASUREMENT CRITERIA/METHODS: Exams, Quizzes, and Homework

P. DETAILED COURSE OUTLINE:

Q. LABORATORY OUTLINE:

- I. Introduction
- a. Use of a command screen and mathematical operators
- b. Management of variables and syntax
- c. Annotation requirements for program code
- II. Plotting
- a. Generating plots and subplots of varies engineering problems
- b. Generating three-dimensional plots
- III. Syntax commands
- a. While loops
- b. If / Eleseif, and Else statements
- c. For loops
- IV. Data input/ output
- a. Strings
- b. Scalar
- c. Vector
- d. Keyboard
- e. File reading and generation
- V. Numerical methods
- VI. Advanced graphics