

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



MASTER SYLLABUS

ENGS 102 – PROGRAMMING FOR ENGINEERS

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Canino School of Engineering Technology

Department: ENGINEERING SCIENCE

Semester/Year: Fall 2022

A. **TITLE:** PROGRAMMING FOR ENGINEERS

B. **COURSE NUMBER:** ENGS 102

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

Credit Hours: 2

Lecture Hours: per week

Lab Hours: 2- two hour labs per week

Other: per week

Course Length: 15 Weeks

D. **WRITING INTENSIVE COURSE:** Yes No

E. **GER CATEGORY:** None: Yes: GER

If course satisfies more than one: GER

F. **SEMESTER(S) OFFERED:** Fall Spring Fall & Spring

G. **COURSE DESCRIPTION:**

This course provides an introduction to 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 in this course will assist in the analysis of engineering problems in more advanced course work. Two hour labs are held twice every week.

H. **PRE-REQUISITES:** None Yes If yes, list below:

MATH 123 w/ C or better or equivalent or higher course

CO-REQUISITES: None Yes If yes, list below:

I. STUDENT LEARNING OUTCOMES: (see key below)

By the end of this course, the student will be able to:

<u>Course Student Learning Outcome</u> <i>[SLO]</i>	<u>Program Student Learning Outcome</u> <i>[PSLO]</i>	<u>GER</u> <i>[If Applicable]</i>	<u>ISLO & SUBSETS</u>	
a. Develop simple predictive models using equation solving software	PENDING ABET OUTCOME UPDATE		2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	PS None Subsets Subsets
b. Illustrate data through 2D and 3D plots			1-Comm Skills 5-Ind, Prof, Disc, Know Skills ISLO	W None Subsets Subsets
c. Demonstrate the use of control structures in programming			2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	PS None Subsets Subsets
d. Recognize the correct use of string vs. numerical data			2-Crit Think ISLO ISLO	CA Subsets Subsets Subsets
e. Apply programming to engineering problems			2-Crit Think 5-Ind, Prof, Disc, Know Skills ISLO	PS None Subsets Subsets

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

*Include program objectives if applicable. Please consult with Program Coordinator

J. **APPLIED LEARNING COMPONENT:** Yes No

If YES, select one or more of the following categories:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Classroom/Lab | <input type="checkbox"/> Civic Engagement |
| <input type="checkbox"/> Internship | <input type="checkbox"/> Creative Works/Senior Project |
| <input type="checkbox"/> Clinical Placement | <input type="checkbox"/> Research |
| <input type="checkbox"/> Practicum | <input type="checkbox"/> Entrepreneurship |
| <input type="checkbox"/> Service Learning | (program, class, project) |
| <input type="checkbox"/> Community Service | |

K. **TEXTS:**

Recommended: MATLAB for Engineers (5th Edition), Holly Moore, ISBN-13: 978-034589640

L. **REFERENCES:**

None

M. **EQUIPMENT:** None Needed:

N. **GRADING METHOD:** A-F

O. **SUGGESTED MEASUREMENT CRITERIA/METHODS:**

Exams, Quizzes, and Homework

P. **DETAILED COURSE OUTLINE:**

I. Introduction

- a. Use of the Matlab command screen and mathematical operators
- b. Management of variables and syntax
- c. Annotation requirements for program code

II. Plotting in Matlab

- a. Generating plots and subplots of various engineering problems
- b. Generating three-dimensional plots

III. Syntax commands in Matlab

- a. While loops
- b. If / Elseif, 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

Q. LABORATORY OUTLINE: None Yes