Syllabus

ESC 170 Computing for Engineers

General Information

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Department
Science and Technology

Course Prefix
ESC

Course Number
170

Course Title
Computing for Engineers

Course Information

Credit Hours
3

Lecture Contact Hours
2

Lab Contact Hours
3

Catalog Description
A first course that introduces a variety of fundamental computational techniques to the engineering student which are essential in the analysis and solution of engineering problems. The course utilizes the software packages of MATLAB and LabVIEW as the main computational tools. Topics include modeling, simulation, numerical analysis, data acquisition, data visualization, and instrument control. Both the structured text and graphical programming approaches are used in the course.

Key Assessment
This course does not contain a Key Assessment for any programs

Prerequisites
None

Co-requisites
Grading Scheme
Letter

First Year Experience/Capstone Designation

This course DOES NOT satisfy the outcomes applicable for status as a FYE or Capstone.

SUNY General Education

This course is designated as satisfying a requirement in the following SUNY Gen Ed category
None

FLCC Values

Institutional Learning Outcomes Addressed by the Course

Inquiry
Perseverance
Interconnectedness

Course Learning Outcomes

Course Learning Outcomes

1. Apply the basic principles of computer programming to the solution of engineering problems.

2. Write text-based programs in MATLAB to analyze basic engineering problems.

3. Use SIMULINK to develop models for simulating dynamic engineering problems.

4. Write basic graphical programs in LabVIEW to control instruments

Outline of Topics Covered

I. MATLAB Structure and Basics
II. M-Files
III. MATLAB Vectors
IV. Matrices in MATLAB
V. Graphing in MATLAB
VI. Solving Linear Equations
VII. Finite Difference Equations - Euler Method
VIII. Numeric Differentiation
IX. Numeric Integration
X. Symbolic math toolbox
XI. Introduction to Simulink
XII. Modeling dynamic systems with Simulink
XIII. Front Panel Controls and Indicators
XIV. Block Diagram arithmetic and logic functions
XV. Types of Numbers and Variables
XVI. For loop, While loop
XVII. Case Structures
XVIII. Introduction to Data Acquisition
XIX. Introduction to Instrument Control