

Fall 2024

## CS 101-001: Computer Programming and Problem Solving

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**CS 101**  
**Introduction to Programming for Engineers**

**Instructor:** Wallace Rutkowski  
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**Textbook:** No textbook required, material will be posted on canvas.

**Grading:** There will be a midterm and a final examination. There will be numerous programming projects posted on **canvas.njit.edu**. There will also be a group project. The group project consists of researching an application of computing in engineering. At the end of the semester each group will make a brief presentation to the class. Groups will consist of 3 to 5 people. We will also introduce a small amount of programming in another language, C++ or Python.

Final grade will be computed as:

Midterm	25%
Programs	25%
Final	30%
Group Presentation	20%

**Topics:**

Part of the course will introduce students to the application of computing in engineering. The majority of the course will teach the basic concepts of imperative programming using the MATLAB programming language. The main topics will be:

1. Input/output
2. Translating equations into MATLAB
  - arithmetic operators
  - vectors
  - vectorization
  - indexing
  - logical indexing
  - calling functions
  - plotting
3. Sequence of control flow
4. Selection statements
  - relational operators
  - logical operators
5. Iteration statements
6. Writing functions
  - parameter passing
  - local variables
7. Advanced Plotting
8. Introduction to Python/C++