

Spring 2020

## CS 106-002: Roadmap to Computing for Engineers

Wallace Rutkowski

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**CS 106**  
**Introduction to Programming for Engineers**

**Textbook:** Think Python  
available online, see **thinkpython.org** or Google 'think python'  
There are many Python resources online.

**Instructor:** Wallace Rutkowski  
email: [wallace.rutkowski@njit.edu](mailto:wallace.rutkowski@njit.edu)  
office: GITC 4413  
phone: 973-596-5483

**Grading:** There will be a midterm and a final examination. There will be numerous programming projects posted on <https://canvas.njit.edu/students> . 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.

The Provost has asked that we include the following statement:

“Academic Integrity is the cornerstone of higher education and is central to the ideals of this course and the university. Cheating is strictly prohibited and devalues the degree that you are working on. As a member of the NJIT community, it is your responsibility to protect your educational investment by knowing and following the academic code of integrity policy that is found at: <http://www5.njit.edu/policies/sites/policies/files/academic-integrity-code.pdf>.

Please note that it is my professional obligation and responsibility to report any academic misconduct to the Dean of Students Office. Any student found in violation of the code by cheating, plagiarizing or using any online software inappropriately will result in disciplinary action. This may include a failing grade of F, and/or suspension or dismissal from the university. If you have any questions about the code of Academic Integrity, please contact the Dean of Students Office at [dos@njit.edu](mailto:dos@njit.edu)”

The point breakdown for the final average will be:

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

Due to the corona virus crisis, all of the above will be replaced with the programming projects posted on canvas.

## 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 Python programming language. The main topics, in order of presentation, will be:

1. Input/output
2. Translating equations into Python
  - arithmetic operators
  - calling functions
3. Control flow
  - boolean expressions
  - relational operators
  - boolean operators
4. Selection statements
  - if/elif/else
  - switch
5. Iteration statements
  - while
  - for
6. Lists
  - indexing
7. Basic algorithms
  - min/max
  - binary search, bisection
  - simple sorting
  - intro to complexity
8. Writing functions
  - parameter passing
  - local variables

## 9. Plotting data