Spring 2020

CS 106-002: Roadmap to Computing for Engineers

Wallace Rutkowski

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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
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

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”

The point breakdown for the final average will be:

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Midterm</td>
<td>25%</td>
</tr>
<tr>
<td>Programs/ Quizzes</td>
<td>25%</td>
</tr>
<tr>
<td>Final</td>
<td>30%</td>
</tr>
<tr>
<td>Group Presentation</td>
<td>20%</td>
</tr>
</tbody>
</table>

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