Course Description
An introduction to programming and problem solving skills using Python, a very high level language. Topics include basic strategies for problem solving, constructs that control the flow of execution of a program and the use of high level data types such as lists, strings and dictionaries in problem representation. The course also presents an overview of selected topics in computing, such as the Internet and software engineering.

Computing is a profession that requires lifelong learning, which is pursued through activities and using types of materials that are similar to those employed by students. In this course, each student will track their own use of learning strategies and materials – learning how to learn efficiently in preparation for a knowledge intensive profession.

Learning this material requires extensive hands-on practice. You should plan to spend twice as much time studying and working problems outside of class (that is, about 6 hours a week) as you do in class.

Course resources
Textbook: Ljubomir Perkovic, *Introduction to Computing Using Python*. There are color, black and white and digital editions of the book, at different prices. The content is the same.

Other course materials:
- Python language V 3.4.1 and integrated development environment (IDLE) can be gotten at [https://www.python.org/downloads/](https://www.python.org/downloads/) You will need to get Python and install it on your personal desktop and/or laptop computer. There is no charge for Python.
- PythonTutor, a program for stepping through and visualizing the execution of Python code at pythontutor.com
- Optional materials: [codecademy.com/tracks/python](http://codecademy.com/tracks/python) and various other online resources.

Course Policies
Class attendance is mandatory. A student who misses more than five classes will be dropped, without credit. Getting to class late or leaving early counts as half an absence.

Meeting with an instructor or classroom assistant (at least) weekly is a mandatory part of the course, and is included in the course grading formula. You may meet with the instructor or classroom assistant for your section or for another section; all instructors and classroom assistants have posted office hours, for supervised individual or group study. Students must attend office hours at least once a week.

Moodle ([http://moodle.njit.edu/](http://moodle.njit.edu/)) will be used to post lecture notes, to submit homework and for course discussion.

Homework and projects must be submitted through Moodle and (as specified) in hard copy by the beginning of class on the due date. They will not be accepted late except for special circumstances (such as jury duty or medical problem), for which you must provide documentation. Each Roadmap
project consists of a written and an oral presentation. All submitted work (including exams) must include your name, course, section and student ID.

You are encouraged to study and to work on assignments together with others; collaboration is a basic learning technique. You may not take credit for the work of others. You must understand and be able to explain all work that you submit.

Presenting your homework answers and presenting your projects in class is a regular part of the course.

Cell phones must be turned off during class. During class time you may not play games, text, email, browse the web or engage in other activities that are not part of the class.

**What You Will Learn**

By the end of this course, you will be expected to know and be able to use these pieces of the computing toolkit to compute the solution of specified problems:

- Devise a problem representation (model) and a sequence of steps (algorithm) that correctly solve the problem posed
- Write a program that implements the algorithm, using
  - A core set of Python language elements (keywords, syntax, variables, modules).
  - Basic data types (integers, floats, strings, booleans, lists, dictionaries, files) and operations on them
  - Statements that perform input and output
  - Statements that control the sequence of execution of a computer program (if/else, for, while, function call/return).

Each homework assignment gives you practice on these concepts and skills, and provides feedback on your progress. You are expected to submit every homework assignment. Each element of this course builds on previous material, and any gaps in your understanding will compromise your ability to successfully complete the course. You understand material when you are able to use it to solve problems and to explain your solutions. Each of the two midterm exams and the final exam test your mastery of the material.

**Topics to be covered**

Starting to code – Python and IDLE
Built-in data types
Variables and expressions
Conditional execution (if/else)
Functions and methods
Modules (turtle, math, random, url)
Passing parameters
Returning values
Iteration (for and while)
Data files
Debugging and testing
Scope and namespaces
User input
Grading Formula
Homework 10%
Attendance at office hours 4%
Midterm 1 and 2, 20% each
Final Exam 30%
Roadmap Projects 10%
Misc 6%

In addition to an overall course score, a minimum grade must be achieved on the final to pass the course.

Exams
There are common midterms on Monday, September 29 and Monday, October 27, 4:00- 5:30 pm. Final exam date: TBA.

You must bring ID to all exams. Students with special needs are advised to make arrangements with Disability Services.

There are no makeup exams. If you miss an exam because of a documented special circumstance you may receive an imputed grade based on the other midterm.

If you believe that you deserve more credit than you have been awarded on a particular problem, you may request, within 48 hours of the exam being returned, that it be regraded. Your entire exam will be regraded, which may result in points being added or subtracted.

Exams do not require any portable electronic devices, such as a mobile phone or calculator. It is preferable that you do not bring any such device to the exam, but if you do bring one you must leave it with the proctor during the exam.

You should read the University Code on Academic Integrity (njit.edu/academics/integrity.php). It describes infractions of academic integrity and penalties for violations, including, for the most serious violations, an XF grade in the course or expulsion. All work that you represent as your own must, in fact, be your own. Work done by others must be given proper credit.

Students will be informed of any modifications of the syllabus during the semester.