

Computer Science 10A

Introduction to Problem Solving with Python

Summer 2023

Contact Details

Instructor: Tim Hickey
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Meeting Times

Classes

Monday, Tuesday, Wednesday & Thursday 9:00 - 11:00 am
on Zoom

Office Hours

Office Hours for the professor and TAs will be posted on the course LATTE page

Course Description

Learning Goals:

This course aims to impart mastery over a set of fundamental programming concepts (or skills). The course will also teach students the fundamentals of the Python Programming language.

Teaching/learning strategies

Being a successful programmer is about more than just producing code that runs. Good programmers will have a solid foundational knowledge of the logic of programming that allows them to not only write code but to write *good* code. Additionally, programmers need to know how to problem solve and how to read and understand code written by others. This course is designed to support students learning from the ground up, starting with the fundamental concepts and building up to more complex applications. Students will be required to demonstrate foundational level understanding of concepts to pass the class, with higher grade outcomes linked to performance on assessments of higher level cognitive operations.

The material covered in this class has been broken down into a set of named skills. Most assignments in this class are graded pass/fail in terms of whether or not the student demonstrated mastery over a particular skill. Performance is tied to the number of skills that a student masters in three different categories.

Prerequisites

This is an intro course with no prerequisites, no major requirements. Because programming is such a fundamental skill, like reading and writing are for Literature, this course does not count towards the CS major or minor.

Credit Hours:

Success in this four-credit course is based on the expectation that students will spend about 24 hours of study time per week in preparation for class (reading, programming, practice, lectures, recitations)

Course Requirements

Academic integrity

Every member of the University community is expected to maintain the highest standards of academic integrity. A student shall not submit work that is falsified or is not the result of the student's own effort. Infringement of academic honesty by a student subjects that student to serious penalties, which may include failure on the assignment, failure in the course, suspension from the University or other sanctions (see section 20 of Rights & Responsibilities). Do not share your code with others in the class or you will be caught and sanctioned.

Daily Skill Quizzes

Recitation is mandatory for this class. The last part of class each day will be used to administer the skill quizzes. The quizzes are made up of short answer questions that test basic knowledge of course skills. The quizzes are graded pass/fail for each question. If a student does not pass a question, they may submit a regrade request through the Mastery Learning App with the correct answer and an explanation of why their original answer was incorrect.

Tracing & Debugging Problems

Tracing & Debugging Problems will be administered via the MLA. These problems will require you to look at a piece of code and explain what it does and/or what is wrong with the code. These problems will additionally utilize the "peer review" function of the MLA, and students will need to view and respond to the answers given by their peers to earn credit.

Programming Assignments

Programming Assignments will be given throughout the semester. There will be a rubric for each assignment that will outline how the assignment will be graded and what is expected of your submission for the assignment.

Evaluation & Essential Resources

- To earn a grade in the **C** range (C-, C, C+) you must pass all of the daily quiz questions, at least 50% of the T&D skills, and at least 3 PAs.
- To earn a grade in the **B** range you must pass all of the weekly quiz questions, at least 70% of the T&D skills, and at least 4 PAs.
- To earn a grade in the **A** range you must pass all of the weekly quiz questions, at least 90% of the T&D skills, and at least 5 PAs.
- The sign (+,-, or none) will be based on the participation as measured by the Mastery Learning App and the Spinoza App exercises.

Accommodations

Brandeis seeks to welcome and include all students. If you are a student who needs accommodations as outlined in an accommodations letter, I want to support you. **Please provide me with your documentation within the first 2 weeks of class.**

Course Materials

This course is partially based on the textbook: Building Python Programs by Reges, Stepp, and Obourn. Pearson 2019, ISBN 9780135205983. The book is not required for the class but you may purchase it if you feel like you would benefit from the additional material. You may also “rent” the digital book through the bookstore.

If you are having difficulty purchasing course materials, please make an appointment with your Student Financial Services or Academic Services advisor to discuss possible funding options and/or textbook alternatives.

LATTE

LATTE is the Brandeis learning management system: <http://latte.brandeis.edu>. Login using your UNET ID and password. All course materials, assignments, lecture notes, videos, calendar, etc. will be linked through Latte.

This class also requires use of the Mastery Learning App (MLA) which will be linked on the LATTE page and requires you to sign up through your Brandeis email account.

TOPICS

The course will cover the following topics:

- Functions and Expressions
- Loops and Pseudocode
- Functions, Parameters, and Return Values
- While Loops and Reasoning about Programs
- Boolean Expressions
- Lists, Indexing and Slices
- Files and I/O
- Sets and Dictionaries
- List, Tuple, Set, and Dictionary Comprehensions
- Searching and Sorting
- Classes and Objects
- Python programs with Data Types
- Exceptions