

Boston University Summer Challenge 2022: Computer Science

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Blackboard (Class Website): learn.bu.edu

Course Overview

The goal of this two-week seminar course is to introduce students to the basics of programming in Python, as well as to some of the broader concepts of programming, software development, and the field of computer science. No previous coding experience is required. Students will complete a group project of their choosing by the end of the course, and receive a final letter of evaluation from the instructor. There will be no formal grade for the class.

The Python tutorial will follow the chapters of *Python Crash Course*, 2nd Edition by Eric Matthews. Course notes based on the textbook will be supplied by the instructor. Students will be given practice problems to work on during class time, along with some suggested problems to complete outside of class during the first week.

By the start of the second week students should form groups of two or three and decide on an idea for a group project. The instructor will provide sample project ideas, though students will not be limited to these. Each group will meet daily with the instructor during the in-class group project sessions. Groups will present their projects on the final day of class.

Course Software

We will use Jupyter Notebooks provided in the Anaconda distribution of Python for the coding tutorials. This will be provided on the lab computers in class, but you may also visit <https://www.anaconda.com/products/individual> to install Anaconda on your own machine (make sure that your version of Python is 3.8 or above).

Tentative Schedule

Week 1: This week will be dedicated to learning Python. We will begin class with a short introduction segment, and then dive into two Python lessons. There will be a short break between the Python lessons. Later in the week we will also introduce two advanced programming concepts: data structures and algorithms.

Monday	Tuesday	Wednesday	Thursday	Friday
Class Overview	Student Intros 1	Student Intros 2	Data Structures Overview	Algorithms Overview
Python: Variables	Python: Lists 2	Python: Dictionaries	Python: Functions	Python: Classes 2
Python: Lists 1	Python: If/Else Statements	Python: User Input and While Loops	Python: Classes 1	Python: File I/O

Week 2: We will begin each class with a short introduction to a broader topic in computer science. The rest of each session will be dedicated to the group projects. The final day of the class is one hour long and is dedicated to group project presentations.

Monday	Tuesday	Wednesday	Thursday	Friday
Software Development	Computer Networks and the Internet	Cryptography	Machine Learning and Artificial Intelligence	Final Presentations
Group Projects	Group Projects	Group Projects	Group Projects	