

CAS CS 111: Introduction to Computer Science I

Syllabus for Boston University Summer Session I 2018

Course Description

The first course for computer science majors and anyone seeking a rigorous introduction. Develops computational problem-solving skills by programming in the Python language, and exposes students to variety of other topics from computer science and its applications.

Prerequisites: None, except a lot of time (see next page about Summer Term workload).

Teaching Staff

Aaron Stevens, *Senior Lecturer* (azs@bu.edu, QST 546F, 595 Commonwealth Avenue)

Katherine Zhao, *Teaching Fellow* (kzhao@bu.edu)

Laura Greige, *Teaching Fellow* (lgreige@bu.edu)

See Blackboard site for tutoring hours schedule.

Meeting Times and Places

Section A1: MTR, 9:30am-12:00pm; MR 12:00-1:00pm, EMA 304

Section A2: MTR, 1:30pm-4:00pm; MR 4:00-5:00pm, EMA 304

Requirements and Grading

1. Daily problem sets and the final project (40% of the final grade)
2. Weekly Quizzes: (50%)
3. Preparation and participation:
 - pre-class reading quizzes (5%)
 - attendance at and participation in the class (5%)

To pass the course, you must earn a passing grade for each of the three components.

Teaching/Learning Method: the “Flipped Classroom”

Learning to program is a skill that takes practice, similar to learning a sport or a musical instrument. You cannot learn to play basketball by simply watching the Celtics; rather, you need to go to the gym and practice your shots. To make the best use of your at-home and in-class time, CS111 will employ the flipped-classroom model.¹ You will be responsible for content-acquisition before coming to class, and we will use in-class time for learning through discussion and programming assignments.

On the day before each class, you will:

- Log into Blackboard to access the readings and examples for the class (under “Content”).
- Watch a few short videos that present mini-lectures and examples relevant to the new material.
- Read the relevant textbook sections to be introduced to vocabulary, concepts, and examples.
- **Practice/re-create the examples on your own**, solving any syntax or logical issues you encounter.

¹ See <http://net.educause.edu/ir/library/pdf/eli7081.pdf>

- Take a short online quiz on Blackboard to prove to yourself that you have acquired the basic concepts, vocabulary and syntax. We can discuss questions from the online quizzes during the following class.
- Read the assignment that we will work on in-class, so that you do not waste precious classroom time reading it.

Your preparation before class is crucial to your success on the assignments.

In class, we will:

- Begin with a brief (approximately 30 minutes) discussion of the new concepts and examples for the day. I will not simply “read” or “review” the examples. We will begin with quiz questions to test your understanding of the material and lead to discussion of more complex areas. I will create new examples as needed to further illustrate complex ideas.
- Discuss the assignment for the day, and what you should work on first/last, and answer questions about the concepts involved.
- Use most of the class time (approximately 2 hours) for you to work independently on the assignments. Students who have adequately prepared the examples before class will be able to finish most of the assignments during class time.

After class, you will:

- Complete the assignment and submit online by the day following class, i.e., the assignment from Monday’s class is due Tuesday by 10pm, etc.

Online Course Materials:

Readings, reading quizzes, and problem sets will be posted on Blackboard: <http://learn.bu.edu>

Discussion on Piazza: <https://piazza.com/class/jh6ok1nr3gk7jr>

Textbook: We will use the free online textbook CS for All by Christine Alvarado, Zachary Dodds, Geoff Kuenning, and Ran Libeskind-Hadas.

It can be found here: <http://www.cs.hmc.edu/csforall/index.html>

Top Hat:

We will be using the Top Hat (www.tophat.com) classroom response system in class. You will be able to submit answers to in-class questions using Apple or Android smartphones and tablets, laptops, or through text message. You can visit the Top Hat Overview (<https://success.tophat.com/s/article/Student-Top-Hat-Overview-and-Getting-Started-Guide>) within the Top Hat Success Center which outlines how you will register for a Top Hat account, as well as providing a brief overview to get you up and running on the system.

An email invitation will be sent to you by email, but if don’t receive this email, you can register by simply visiting our course website: <https://app.tophat.com/e/632919>

Top Hat will require a paid subscription, and a full breakdown of all subscription options available can be found here: www.tophat.com/pricing.

Should you require assistance with Top Hat at any time, due to the fact that they require specific user information to troubleshoot these issues, please contact their Support Team directly by way of email (support@tophat.com), the in app support button, or by calling 1-888-663-5491.

About the Summer Term Workload

This course will follow a rigorous schedule of assignments. Each assignment corresponds to a section of the course content and textbook. Failure to keep up with the assignments will result in your failing the course. Each session builds on the prior session and is a required building block for the following session.

It is very difficult for you to be successful in the course if you miss any class sessions. It will not be possible for you to catch up and pass the course if you miss two class sessions in a row. *In the event of multiple absences, you should withdraw from the course.*

In our past experience, students should expect CS111 in summer session to consume 40 hours (or more) per week. We **strongly recommend** that you do not take other time-intensive courses or attempt to work a job/internship while taking CS111 in the summer session.

What You Need to Know About Computer Programming²

I believe anyone can succeed at learning to program. This is a first course in computer programming, and there are no formal pre-requisites. The only expectation of students' computer skills before taking this class is to be comfortable with using email, web browsing, and copying and pasting text. In addition, familiarity with high school-level algebra (e.g. MA 118) is assumed.

In addition, you will need time, and this is more important than you can imagine. Many people believe that computer programming is extremely difficult, and that the code is written in some arcane syntax understandable only by experts. Although some parts of the process are indeed complex, most of the source code required for homework assignments can be easily understood.

So, what makes programming so hard? It's not the difficulty: It's the time required to achieve any decent results. The homework assignments will take time, so make sure you have plenty of it.

² Adapted from text in "Core Techniques and Algorithms in Game Programming," Daniel Sanchez-Crespo Dalmau.

Collaboration Policy

You are strongly encouraged to collaborate with one another in studying the course materials and preparing for quizzes and exams.

Problem sets will include two types of problems:

- *individual-only* problems that you must complete on your own
- *pair-optional* problems that you may complete alone or with a partner.

For both types of problems, you may discuss ideas and approaches with others (provided that you acknowledge this in your solution), but such discussions should be kept at a high level, and should not involve actual details of the code or of other types of answers. **You must complete the actual solutions on your own** (or, in the case of a pair-optional problem, with your partner if you choose to use one).

Rules for working with a partner on pair-optional problems:

- You may *not* work with more than one partner on a given assignment. (However, you are welcome to switch partners between assignments.)
- **You may *not* split up the work and complete it separately.**
- **You must work together at the same computer for every problem that you complete as a pair.** While you are working, the screen should be visible to both of you. One person should type, while the other person observes, critiques, and plans what to do next. You should switch roles periodically, and your solution should be a true collaborative effort.
- You must *both* submit the same solution to each problem that you did as a pair, and you must clearly indicate that you worked on the problem as a pair by putting your partner's name at the top of the file.

Academic Misconduct

We will assume that you understand BU's Academic Conduct Code:

<http://www.bu.edu/academics/policies/academic-conduct-code>

Prohibited behaviors include:

- copying all or part of someone else's work, even if you subsequently modify it; this includes cases in which someone tells you what you should write for your solution
- viewing all or part of someone else's work (with the exception of work that you and your partner do together on a pair-optional problem)
- showing all or part of your work to another student (with the exception of work that you and your partner do together on a pair-optional problem)
- consulting solutions from past semesters, or those found online or in books
- posting your work where others can view it (e.g., online).

Incidents of academic misconduct will be reported to the Academic Conduct Committee (ACC). The ACC may suspend/expel students found guilty of misconduct. ***At a minimum, students who engage in misconduct will have their final grade reduced by one letter grade (e.g., from a B to a C).***

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Other Policies

Late problem sets: Problem sets must be submitted by the date and time listed on the assignment. There will be a 10% deduction for homework that is up to 24 hours late. We will not accept any homework that is more than 24 hours late. Plan your time carefully, and don't wait until the last minute to begin an assignment. **Starting early** will give you ample time to ask questions and obtain assistance from members of the course staff.

Pre-class reading quizzes: To help you prepare for class, you will typically be required to complete an assigned reading and to answer a short online quiz based on the reading. Your answers do not need to be correct, but they should demonstrate that you have completed the assigned reading carefully and have attempted to understand it. The quizzes must be submitted by the date and time listed on the reading assignment. No late reading-quiz submissions will be accepted.

The **attendance/participation** portion of your grade will be based on your consistent attendance at the class and lab sessions, and on your participation in the activities that are part of each class. In particular, you must participate in small-group activities during class in which you will discuss questions with other students and use a clicker to "vote" on the answers. These activities are designed to deepen your understanding of the material, and you will be graded on your participation, not on the correctness of your answers. To accommodate unavoidable absences or lateness, you will receive full credit for participation as long as you make at least 85% of the votes over the course of the semester and attend 85% of the lab sessions. Using a clicker for someone else is not allowed, and will result in a lowering of the participation grade of both of the students involved.

The final exam will replace your lowest quiz grade, if doing so helps your final grade.
The final exam will also replace your lowest problem-set grade if doing so helps your final grade.
(The final-project grade cannot be replaced.)

Extensions and makeup exams will only be given in documented cases of serious illness or other emergencies. Incompletes will not be given except in extraordinary circumstances.

You may not redo or complete extra work to improve your grade.