CAS CS 111: Introduction to Computer Science I
Syllabus for Boston University Summer Session I 2016

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@cs.bu.edu, PSY 228B, 64 Cummington Mall)
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See Blackboard site for tutoring hours schedule.

Meeting Times and Places
Section A1: MTR, 9:30am-12:00pm, EMA 304
Section A2: MTR, 1:30pm-4:00pm, EMA 304

Online Course Materials:
Readings, reading quizzes, and problem sets will be posted on Blackboard: http://learn.bu.edu
Discussion on Piazza: http://piazza.com/bu/summer2015/cs111

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/csforsall/index.html

Clicker: We will be using Turning Technologies ResponseWare for in-class activities and attendance. You will need either:

(a) a Turning Technologies Clicker RF LCD and 4-year account (ISBN 9781934931783; available at the BU Bookstore); or

(b) The ResponseWare app for your phone or tablet device and a student license. If you choose to use this app, you can find details at: https://www.turningtechnologies.com/response-solutions/responseware

In either case, you will need to register your Clicker or ResponseWare device by creating a TurningTechnologies account online (start from Blackboard).

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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. 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”).
• Read the relevant textbook sections to be introduced to vocabulary, concepts, and examples.
• Watch a few short videos that present mini-lectures and examples relevant to the new material.
• **Re-create the examples on your own**, solving any syntax or logical issues you encounter.
• 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 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 example 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 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.

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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.

Requirements and Grading
1. Daily problem sets and the final project (40% of the final grade)
2. Exams: two midterm exams (25%) and a final exam (25%)
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.

What You Need to Know About Computer Programming
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.

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

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 one other student.

**General Rules for Collaboration:**

- You *should* discuss the main ideas of a given problem with other students (provided that you acknowledge doing so in your solution), but you must complete the actual solution by yourself.
- You *should* discuss program test cases and outputs, and draw conceptual diagrams (i.e., on paper) to explain/discuss how your program is behaving. This is the most valuable and productive kind of collaboration.
- You *may not* copy all or part of another person's work, even if you subsequently modify it.
- You *may not* view all or part of another student's work.
- You *may not* show all or part of your work to another student.
- You *may not* consult solutions from past semesters, or those found in books or on the Web.
- You

**Rules for Working with a Partner on Pair-optional Problems:**

- You may work with only one partner on a given assignment. (You are welcome to switch partners between assignments.)
- You *may not split up the work* and complete it separately. This will result in only one student actually learning the material, and the other student will be unable to complete subsequent assignment and the written exams.
- 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 must 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.
- Although you will look at your partner's work for pair-optional problems that you do together, the above rules for collaboration still apply to your interactions with students other than your partner. Violations of the collaboration policy will result in a grade of 0 and will be reported to the Academic Conduct Committee (ACC). The ACC may suspend/expel students found guilty of misconduct. We will assume that you understand BU’s Academic Conduct Code: [http://www.bu.edu/academics/policies/academic-conduct-code](http://www.bu.edu/academics/policies/academic-conduct-code)
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 problem-set grade if doing so helps your final grade. (The final-project grade cannot be replaced.) The final exam will also replace your lowest midterm-exam grade if doing so helps your final grade.

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.