CAS CS 111: Introduction to Computer Science I
Boston University, Spring 2025

Syllabus

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.

This course fulfills a single unit in each of the following BU Hub areas: Quantitative Reasoning II, Creativity/Innovation, Critical Thinking. ***No prerequisites.***

Important: CS 111 is a time-consuming and demanding course that is primarily intended for students who plan to take more advanced computer science courses. **You should *not* take the course if you have other major time commitments, and you should *not* take it primarily for the purpose of fulfilling Hub areas.** Other options include CS 101, CS 103, CS 108, and DS 100.

Instructors
A1: David G. Sullivan, Ph.D. (dgs@bu.edu, CDS 809, 665 Commonwealth Ave.)
B1: Tiago Januario, Ph.D. (januario@bu.edu, CDS 911, 665 Commonwealth Ave.)

Teaching Assistants (TAs)
Eric Gao (ericg123@bu.edu)   Brinja Vogler (bvogler@bu.edu)
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Course Assistants (CAs)
We are fortunate to have a number of undergraduate course assistants (CAs) as members of the course staff. They will be assisting you in the labs and holding office hours each week. See the course website for their names and contact info.

Office Hours: These will be posted on the course website (see below).

Lectures and Labs
lectures: section A1: MWF, 10:10-11:00 am, MOR 101
            section B1: MWF, 12:20-1:10 pm, CAS B18
lab: a weekly session; see your schedule for the time and location

Midterm Exams
You must be able to take the midterm exams, which will be held on two Wednesday evenings (March 5 and April 9) from 6:30-7:45 p.m. in locations to be announced. We are not scheduled to meet on any other Wednesday evenings.

Course Website: http://www.cs.bu.edu/courses/cs111
In addition, some course materials will be posted Blackboard.

Requirements and Grading
1. Weekly problem sets and final project (25% of the final grade)
2. Exams: two midterm exams (30%) and a final exam (35%)
3. Participation (10%; see below)

To pass the course, you must have a passing average on the problem sets and a passing average across the three exams.

Collaboration Policy

You are strongly encouraged to collaborate with one another in studying the lecture materials and preparing for the exams. Problem sets will include:

- *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 or via a Zoom meeting) for all problems completed as a pair, and your work must be a collaborative effort.
- You and your partner 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 you have carefully read and understood BU's academic conduct code: http://www.bu.edu/academics/policies/academic-conduct-code

You should also carefully review the CS department's page on academic integrity: http://www.bu.edu/cs/undergraduate/undergraduate-life/academic-integrity

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 to 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)
- giving another student access to your laptop unless you monitor their usage
- consulting solutions from past semesters, or those found online or in books
- using ChatGPT, GitHub Copilot or other forms of generative AI when writing code or solving other types of problems on the homework assignments
- posting your work where others can view it (e.g., online), even after you complete the course

- receiving assistance from or collaborating with others during an exam, or using materials or devices except those that are explicitly allowed.

Incidents of academic misconduct may be reported to the Academic Conduct Committee (ACC), and the ACC may suspend/expel students found guilty of misconduct. ***At a minimum, students who engage in misconduct will receive a score of 0 on the assignment or exam in question.***

Course Materials
- **Required:** CS 111 Coursepack. This contains all of the lecture notes for the course. More detail will be provided in class and in Lab 0.
- **Optional:** *CS for All* by Alvarado, Dodds, Kuenning, and Libeskind-Hadas (Franklin Beedle, 2019). This book is *not* required.
- **Required:** We will be using the Top Hat Pro platform. More detail will be provided in class.

Other Policies
Writing code: The problem sets will require you to write code using the Python programming language. In doing so, ***you must limit yourself to aspects of Python that we have discussed in lecture, unless the problem indicates otherwise.*** At a minimum, failure to do so will result in a score of 0 for the corresponding problem.

Late problem sets: Problem sets must be submitted by the date and time listed on the assignment (typically by 11:59 p.m.). There will be a 10% deduction for submissions 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 so you will have time to ask questions and obtain assistance from the course staff.

Pre-lecture preparation: To prepare for lecture, you will typically be required to watch one or two short videos and to complete an online quiz on Top Hat. Your work on these quizzes will not typically be graded for correctness, but it should demonstrate that you have adequately prepared for lecture. The pre-lecture quizzes must be submitted by the specified date and time; **late submissions will not be accepted**.

Your *participation grade* will be based on three things: (1) the pre-lecture and in-lecture questions on Top Hat, (2) lecture attendance taken using Top Hat, and (3) lab attendance. You will receive full credit for participation if you earn at least 85% of the points on Top Hat, make 85% of the lecture-attendance votes, and participate in at least 85% of the lab sessions. For a given component, if you end up with x% where x is less than 85, you will get x/85 of the possible points.

Absences: The above participation policies are designed to allow for occasional absences due to illness or other special situations. We will record the lectures and make the recordings available to everyone. If you need to miss a lecture for any reason, you should watch the recording for that lecture as soon as possible after it is posted. In addition, you should keep up with the pre-lecture tasks and the current assignments. **Please do not email your instructor about absences of this type.**

Laptops: Students taking CS courses are expected to have a laptop capable of running a currently supported version of Microsoft Windows, Mac OS X, or Linux. See this page for more info: https://www.bu.edu/cs/undergraduate/undergraduate-life/laptops

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. Regardless of whether any such replacements occur, the final exam itself will always count for at least 35% of the final grade.

The final grades are *not* curved. The performance of the class as a whole is taken into account in assigning letter grades, but this can only improve your grade, not harm it.

Extensions and makeup final exams will only be given in *documented* cases of serious illness or other emergencies. We do not give makeup midterm exams; if you need to miss one, your grade for it will be replaced by your final-exam grade (see above).

You cannot redo or complete extra work to improve your grade. Incompletes will not be given except in extraordinary circumstances.

Schedule (tentative)

week	lecture dates	topics, exams, assignments, and special dates
0	1/22, 1/24	Course overview and introduction Python basics; data types and expressions *No labs this week*
1	1/27, 1/29, 1/31	Strings and lists A first look at functions Making decisions (conditional execution) **Problem Set 0 (all) due on 2/2**
2	2/3, 2/5, 2/7	Functions (cont.) Local and global variables; the runtime stack Recursion *2/3: last day to add a class* **Problem Set 1, part I due on 2/6** **Problem Set 1, part II due on 2/9**
3	2/10, 2/12, 2/14	Recursion (cont.); recursive design List comprehensions **Problem Set 2, part I due on 2/13** **Problem Set 2, part II due on 2/16**
4	**2/18**, 2/19, 2/21	Lists of lists; encryption and decryption Algorithm design Representing information *No lecture on 2/17 (Presidents Day)* ***Lecture on 2/18 (Monday schedule)*** *No labs this week* **Problem Set 3, part I due on 2/20** **Problem Set 3, part II due on 2/23**
5	2/24, 2/26, 2/28	Binary addition Gates and circuits; minterm expansion *2/25: last day to drop without a 'W'* **Problem Set 4, part I due on 2/27** **Problem Set 4, part II due on 3/2**

6	3/3, 3/5, 3/7	Arithmetic circuits and modular design Loops and imperative programming Cumulative computations **Midterm 1 on 3/5 from 6:30-7:45 p.m.**
		Spring break
7	3/17, 3/19, 3/21	Loops (cont.); design using loops Nested loops **Problem Set 5, part I due on 3/20** **Problem Set 5, part II due on 3/23**
8	3/24, 3/26, 3/28	References; mutable vs. immutable data 2-D lists Object-oriented programming; file processing **Problem Set 6, part I due on 3/27** **Problem Set 6, part II due on 3/30**
9	3/31, 4/2, 4/4	Classes: creating your own types of objects Dictionaries *4/4: last day to drop with a 'W' or* *change to Pass/Fail* **Problem Set 7, part I due on 4/3** **Problem Set 7, part II due on 4/6**
10	4/7, 4/9, 4/11	Classes (cont.) **Midterm 2 on 4/9 from 6:30-7:45 p.m.** **Problem Set 8 (all) due on 4/13**
11	4/14, 4/16, 4/18	Games and AI Inheritance Overview of the final project Finite-state machines **Problem Set 9, part I due on 4/17** **Problem Set 9, part II due on 4/20**
12	4/23, 4/25	Finite-state machines (cont.) Algorithm efficiency and problem "hardness" *No lecture on 4/21 (Patriots Day)* *Labs **will** meet (Wednesday is a Monday schedule)* **Final-project milestone due on 4/24** **Problem Set 10 due on 4/27**
13	4/28, 4/30	Problem "hardness" (cont.) Course wrap-up **Full final project due on 4/30** *5/2-4: Study period*
14		**Final exam: date and time TBD** **Please wait until your instructor informs you of the date before you make any travel plans.** ***Make sure that you are available for the entire exam period – up to and including Friday evening, May 9!***