



CS 103 Introduction to Programming

Units: 4

Fall 2024

Location: T/TH 8a - 9:20 DMC 101 (Slocum)
T/TH 9:30a - 10:50 SAL 101 (Goodney)
T/TH 11a - 12:20 THH 102 (Goodney)

Instructor: Andrew Goodney and Carter Slocum

Office: TBD (CS Offices are moving Sept. 2024)

Office Hours: See website

Contact Info:

goodney@usc.edu

cpslocum@usc.edu

Teaching Assistants and UG tutors:

See website

Course Description

This class is an introduction to computer programming, using C++ as the programming language. You will learn about variables, types, loops, conditional statements, functions, input/output, arrays, recursion, dynamic memory, object-oriented programming, performance, and several data structures. You will get a lot of practice reading, writing, and debugging computer programs. We assume some basic programming experience (eg. CSCI 102), which will be reviewed at the beginning of the semester followed by a fairly fast paced course. Those needing an on-ramp to programming are required to take the 2-unit CS 102 course before CS 103.

Learning Objectives

Below are the specific, measurable skills a student will demonstrate by the end of the course. These objectives will be both taught and assessed in the course and are aligned with the assignments, assessments and learning materials.

1. Write computer programs using conditional and iterative structures, and functional decomposition.
2. Develop simple algorithms to solve computational problems.
3. Determine the computational complexity of simple algorithms.
4. Implement key algorithms within the field.
5. Perform functional decomposition and trace recursive solutions.
6. Select and implement appropriate basic data structures (e.g. arrays, linked-lists, array-based lists) and their access methods (e.g. pointers)
7. Correctly and efficiently manage memory and the lifetime of objects
8. Create programs that utilize both terminal and file I/O methods to perform data analysis.
9. Apply object-oriented design principles.
10. Use command line development tools needed to write, compile, and debug basic C++ programs.

Prerequisite(s): CS 102 (Students must complete CSCI 102, or pass its challenge exam, or have AP Computer Science A credit to enroll in this course.) This means you must have a working understanding of Java, C, or C++.

Co-Requisite(s): None

Recommended Preparation: Proficiency in high school math (including trigonometry, algebra, and basic probability).

Course Materials

All content will be provided on our website: <http://bytes.usc.edu/cs103>. PDF versions of lecture slides will be posted on our website before lecture and may be printed before coming to class or used electronically.

Course Websites

1. **Primary website:** All course assignments, content, office hour information, etc. will be posted at our main website: <http://bytes.usc.edu/cs103>.
2. **Q&A website:** A Q&A and announcement website, EdStem will be utilized: All official announcements regarding assignments, lectures, exams, etc. will be made via EdStem. It is your responsibility to check this site often. See the course website for a link to the discussion board.
3. **Brightspace:** Brightspace (<http://brightspace.usc.edu>) will also be used to record homework, quiz, and exam grades.
4. **Codio:** Lab and homework code submissions will be made via Codio.com Click the Codio link on the course website to register. **Cost is ~\$45.**
5. **Gradescope:** Used for exams and some homework.

Attendance

In-person attendance is the only supported mode for lecture and lab. In general we will not record the class lecture. However, we may also periodically post recordings for review and study. We encourage you to review lecture notes, attend office hours, and form study groups in place of relying on recorded lectures for review.

Labs: Labs are **in-person only**. Our lab grading policy is designed for flexibility with a number of allowed absences intended to cover the case of illness or unavoidable schedule conflicts. Please note: save your lab absences for when you really are sick or unable to attend vs. just sleeping in or wanting to go out of town for a long weekend. If you have used all your absences and then are unable to attend, you will not get credit for that lab (except for extraordinary situations determined on a case-by-case basis).

Technological Proficiency and Hardware/Software Required

A laptop and Internet connection are required to complete homeworks and other assignments. Exams will also be given using online methods, so **a laptop with 90 min. of battery life is required.**

Readings and Supplementary Materials

The following textbooks are **require-mended** (technically NOT **required** but strongly **recommended**) and will be referenced for readings and a major source of exercises and practice problems. We **recommend** you read the sections listed on the course schedule below for the corresponding week **BEFORE** attending the first lecture of that week.

1. Brief C++ Late Objects, Cay Hortsman, J Wiley and Sons, (ISBN: 978-1119739708) or the older edition: C++ For Everyone, 2nd Ed., Cay Horstmann, J Wiley and Sons, 2012 (ISBN: 978-0470927137) *Available at the bookstore and or from an online retailer.*

Description and Assessment of Assignments

Homeworks and Projects

Availability: Homework and projects will be made available on Codio

Due dates and Codio: The due date of each assignment is shown on the HW/Projects webpage. This is the date by which the assignment should be done for full credit. **You MUST mark your assignment "COMPLETE" BEFORE the due date.** If you are not done with the assignment you may continue to work on it after the due date with late penalties (see below) applied. If you mark your homework complete and then realize you want to modify something, you may re-open your assignment, however if you do so after the due date you will incur the penalties below (even if you don't make any changes) and then you will need to mark it as complete when you are done.

Grading/Rubric: As you complete portions of your HW code you will need to run checks in Codio. You should always review these results to ensure your program is outputting the desired information **in the**

correct format (since a majority of the automated tests look for exact text matches, any formatting errors will lead to test failures). It is your responsibility to ensure (through review of the submission reports) that your program is producing the desired output format and values. Regrades will NOT be accepted for reasons such as, "I saw the green check mark and thought the tests passed." **Finally, no partial credit is given for code that does not pass the tests. So ensure you leave a few days for debugging your code.**

Late Submission: You may submit HW and project assignments up to **48 hours (2 days)** late. A submission made within 1 day of the due date is only eligible for **90% credit** and a submission made within 2 days of the due date is only eligible for **80% credit**, so please try to get your work done and submitted on time. NO excuse for laptop connection/network issues, etc. will be accepted for late submissions. Codio can be accessed through any web-browser, so you can always go to a USC computer lab or borrow a friend's laptop should yours break. You should ensure you submit early to avoid any potential problems and thus avoid late penalties. After 48 hours, submissions will be rejected.

Solutions: Solutions to the assignments will not be made available. However, if you want help fixing features of your code you could not get right, please reach out to course staff after the due date.

Collaboration and Academic Integrity: Homework assignments are to be completed individually unless otherwise noted. **You are NEVER allowed to show, verbally describe, or otherwise share any part of your code with another student.** You should NOT verbally describe your code or guide another student on what to write or what to do. Furthermore, coding together on projects should be done with caution. Developing similar pseudocode or even planning together when done at a detailed level can lead to code that is pretty much the same (and really a team effort vs. an individual effort) and is considered a violation. **Finally, copying (and then modification) or just "viewing for reference" any portion of code from Internet sources (including AI or websites) or fellow students is prohibited unless explicitly cleared with the instructor.**

Policy for AI-generated work: Since creating, analytical, and critical thinking skills are part of the learning outcomes of this course, all assignments should be prepared by the student working individually or in groups. Students may not have another person or entity complete any substantive portion of the assignment. Developing strong competencies in these areas will prepare you for a competitive workplace. **Therefore, using AI-generated work in whole or in part (even for reference) is prohibited in this course, will be identified as plagiarism, and will be reported to the Office of Academic Integrity.**

Note: Students with a pending violation or who are found to have violated academic integrity may NOT drop the course, even if you agree with the violation. In addition, the recommended sanction will be a -50% on the assignment (not half credit, but 0 and an additional 50% penalty). So, your score in the gradebook will not be 0, but -50. The rationale for this policy is that a 0 is the score students who were unable to solve the assignment but did not violate the course policies would also get. So there must be a greater penalty for violations (i.e. -50).

You MAY use generative AI tools for working on **non-graded practice**, or conceptual questions that don't involve assignment-specific problems. Use it to help you practice on OTHER problems so that you can do the HW on your own and with the help of only the course staff.

Contesting Grades: In general because the HW and Projects are graded automatically there are no regrade requests. However, if you have an issue with grading on a HW or Project you may post to EdStem and the course staff will determine if there is a bonafide issue and how best to resolve the problem.

After the semester: You MAY NOT post your solutions to assignments on public websites like github.com, etc as they are derived from assignments which are copyrighted by your instructors and are the property of USC. Any such action will be deemed a violation of academic integrity.

Labs

Each week you will meet in your registered Friday lab time. To ensure seating availability and fairness of time distribution from our course staff, you may ONLY attend the lab section for which you are registered. However, not all weeks have graded labs, as some weeks are designed to be more open for your benefit.

Graded Labs: We will have roughly **8 weeks of graded labs**. During those weeks, labs are graded **Credit**

(CR) / No Credit (NC). You will receive credit for attending the majority of the lab session and, in addition, achieving a score of 50% or better on the specified lab tasks. They must be completed during your registered lab session. **(Note: Do not worry if Brightspace shows your raw score on a lab. As long as it meets the 50% threshold for credit, you will get FULL marks when we calculate grades at the end of the semester).**

You may miss 2 labs without penalty. After missing 2 graded labs, you will lose 1 of the 6% that labs account for you in your course grade for each additional absence.

For any errors in recording your credit, you have 1 week after your grade is posted to contest the issue. Start by reaching out to your lab leaders. If you cannot resolve the issue, post a PRIVATE note on EdStem and indicate the issue that you and your lab leaders have discussed.

Ungraded Labs: During ungraded lab weeks you may attend or not, as you deem necessary. We will often provide some planning tips for the current assignment(s) or review concepts and best-practices on the previous assignment. We will always leave some portion of time for open questions and help on your assignment(s).

Exams

Time and Location: There will be one written midterm, a programming exam and one final. The midterm exam will be held during the quiz section on **Week 8**. The programming exam will take place during the quiz section in **Week 12** and **Week 13**. Depending on how you do on the first part of the programming exam, the second session may be optional. The exams will likely be in alternative (larger) classrooms. Always check with the instructor as the listed exam date approaches to confirm the date and time. The exam location will be announced in class and on the web site. You are responsible for finding out when and where the exams will be held. Makeup exams will be given if you have a valid excuse (e.g. serious illness or accident but proof will be required).

Academic Accommodations: If you have USC approved academic accommodations, please check with your instructor 2 weeks before the exam to determine when and where you will take the exam.

Exam Style: Exams are designed to not only test your retention of the material but your ability to apply it to design and analyze new or novel problems. In this way, your mastery and depth of understanding of the course content will be assessed. Exams are usually administered via Gradescope and Codio and so you will **need a laptop with sufficient battery life**. For coding questions, you will write your code on Codio.com. Because most points will come from coding problems or tracing through provided code to analyze its behavior, your struggle with the homework coding problems and lab exercises will greatly pay off. *Students who simply "get the assignments done" without reviewing and understanding each facet, will often struggle on the exams.*

Grading Breakdown

Component	% of Grade
Labs	6%
HW	16%
HW1-6 2.5%	
HW7 1%	
Projects	20%
4x 5% each	
Exams	58%
Lowest exam 14%	
Median exam 20%	
Highest exam 24%	

Grading Scale:

Course final grades will be determined using the following scale. If the grade distribution is lower than expected the scale may be shifted downward but will never be shifted upward.

A 94-100	B+ 87-89	C+ 77-79	D+ 67-69	F 59 and below
A- 90-93	B 83-86	C 73-76	D 63-66	
	B- 80-82	C- 70-72	D- 60-62	

Assignment Rubrics

See the section above for relevant assessment procedures for homeworks.

Grading Timeline

Homework and Projects will be graded on the Codio. All grading of homeworks and projects is automated.

Course Schedule: Please see the course website

Statement on Academic Conduct and Support Systems

Academic Integrity:

The University of Southern California is a learning community committed to developing successful scholars and researchers dedicated to the pursuit of knowledge and the dissemination of ideas. Academic misconduct, which includes any act of dishonesty in the production or submission of academic work, compromises the integrity of the person who commits the act and can impugn the perceived integrity of the entire university community. It stands in opposition to the university's mission to research, educate, and contribute productively to our community and the world.

All students are expected to submit assignments that represent their own original work, and that have been prepared specifically for the course or section for which they have been submitted. You may not submit work written by others or "recycle" work prepared for other courses without obtaining written permission from the instructor(s).

Other violations of academic integrity include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), collusion, knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university. All incidences of academic misconduct will be reported to the Office of Academic Integrity and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see [the student handbook](#) or the [Office of Academic Integrity's website](#), and university policies on [Research and Scholarship Misconduct](#).

Please ask your instructor if you are unsure what constitutes unauthorized assistance on an exam or assignment, or what information requires citation and/or attribution.

Students and Disability Accommodations:

USC welcomes students with disabilities into all of the University's educational programs. [The Office of Student Accessibility Services](#) (OSAS) is responsible for the determination of appropriate accommodations for students

who encounter disability-related barriers. Once a student has completed the OSAS process (registration, initial appointment, and submitted documentation) and accommodations are determined to be reasonable and appropriate, a Letter of Accommodation (LOA) will be available to generate for each course. The LOA must be given to each course instructor by the student and followed up with a discussion. This should be done as early in the semester as possible as accommodations are not retroactive. More information can be found at <https://osas.usc.edu>. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call

Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)

A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu

Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.