CSCI 103L Introduction to Programming

Units: 4

Fall 2025 Lecture Details:

T/Th 9:30am – 10:50am SAL 101
T/Th 11:00am – 12:20pm THH 102

Instructor: Dr. Andrew Goodney, PhD

Office: Ginsburg Hall
Office Hours: Monday 1pm – 2pm, Tuesday 1pm – 2pm Ginsburg Hall Lower Levels (see website for details)
Contact Info: goodney@usc.edu

Teaching Assistants and Tutors:

TBD – See Course Website

Course Website:

https://bytes.usc.edu/cs103/

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 or a passing score on the AP CS Exam), which will be reviewed very briefly 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 along with object-oriented decomposition techniques.
2. Develop simple algorithms to solve computational problems.
3. Determine the computational complexity of simple algorithms.
4. Apply object-oriented design principles.
5. Correctly and efficiently manage memory and the lifetime of objects
6. Formulate programmatic solutions to open-ended problems.
7. Trace recursive solutions.
8. Select and implement appropriate basic data structures (e.g. arrays, linked-lists, array-based lists) and their access methods (e.g. pointers)
9. Create programs that utilize both terminal and file I/O methods to perform data analysis.
10. Use Linux 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 working understanding of Java, C, or C++.
Co-Requisite(s): None, **Concurrent Enrollment:** None
Recommended Preparation: Proficiency in high school math (including trigonometry, algebra, and basic probability).

Attendance

Lectures: In person attendance is the only supported modality for this course. Lectures are not recorded. We encourage 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 and there are no makeup labs. The lab grading policy is designed for flexibility with a number of allowed absences intended to cover the case of illness or unavoidable scheduling conflicts. Note: save your lab absences for when you really are sick or unable to attend vs. sleeping in or planning a long weekend. Lab absences are excused only in the case of University required travel (e.g. sports teams or academic conferences) or in extraordinary cases where USC Campus Support and Intervention (or other student health/wellness office) are involved.

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. **Discussion Board:** 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. https://edstem.org/
3. **Brightspace**: Brightspace (https://brightspace.usc.edu/) will serves that launching point to enter the websites used for assignments and exams (i.e. Codio and Gradescope). It will also be used to record and display assignment and exam grades.
4. **Codio (Accessed through Brightspace links):** Lab and homework code submissions will be made via Codio.com which is a website that you can access through Brightspace. Click the link the Codio link on our Brightspace->Assignments page to register. Cost is $48. https://codio.com
5. **Gradescope (Accessed through Brightspace links):** Used for exams and some homework. It can be accessed via Brightspace. Click on the Gradescope link our Brightspace->Assignments page. https://gradescope.com

Technological Proficiency and Hardware/Software Required

A laptop and Internet connection are required to complete the coursework. The programming exam will also be given using online methods, so a **laptop with 90 min. of battery life is required.**

Required Readings and Supplementary Materials

The following textbooks are “reco-quired” (technically NOT required but strongly recommended) and will be referenced for readings and are a source for 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 Hortsmann, 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. In Fall 2025 an e-Book version will be provided automatically to enrolled students.

Category	Criteria
Labs	+1 Miss at most 3 labs +0 otherwise
Homeworks	+1 Earn 75% or more on 5 out of 6 HW +0 Otherwise
Projects	+1 Earn >=75% on 2, and 100% on all others +0 Earn >=50% on 1, >=75% on 1 and 100% on 1 -1 Otherwise
Written MT	+2 Score >= 90% +1 75% <= Score <= 89% +0 60% <= score <= 74% -1 Otherwise
Programming MT	+2 Score >= 75% (45 points) +1 50% <= Score (30 points) +0 Otherwise
Final Exam	+2 Score >= 88% +1 72% <= Score < 88% +0 56% <= score < 72% -1 40% <= score < 56% -2 Otherwise

A	>=8
A-	7
B+	6
B	5
B-	4
C+	3
C	2
D	1
F	0

Grading Breakdown

In CSCI 103L we use a grading system based on points. For each category shown above you can earn +2, +1, +0 points or even negative points depending on your score for that category. Everyone starts with two points, ie. a grade of "C". From there you simply add up your points to determine your final course grade.

Description and Assessment of Assignments

Homework and Projects

Homework assignments are smaller programming or multiple choice assignments that focus more narrowly on the current topics in lecture. Projects are larger programming tasks that may combine several concepts (past and present) that usually have some particular application of interest.

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. DO NOT UNMARK IT COMPLETE after the end date (eg. to study, etc.)

Grading/Rubric: As you complete portions of your HW code you will need to run checks in Codio. The Codio interface is NOT always intuitive. 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. Though grades are based on the automated test, you must follow the guidelines in the CS 103 style guide.

Late Submission: You may submit homework and projects late until 11:59 PM on the day BEFORE the next exam after the HW or project due date or the last day of classes for the last set of HWs. However, a late submission is only eligible for 75% 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 the late deadline, no submissions will be accepted.

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, Academic Integrity, and Policy for AI-generated work: Coding, like exercise or weight training, cannot produce its intended benefit when others do what you should do for yourself. Thus, we do not allow AI use for any reason in this course. Only by struggling through the homework and projects, will you prepare yourself for the exams and future courses. With that said, please follow the rules below to avoid Academic Integrity Violations.

Collaboration/AI Policy for Homework Assignments: May be done individually or in teams of 2. You must list your team member in your source code as a comment on the top line. The intent of homeworks is to form your basic skill set and understanding of lecture material. Because use of generative AI would remove any of that benefit, we do not allow its use.

Collaboration/AI Policy for Projects and Exams: Projects and exams must be completed individually (except for the team-based lab project later in the semester) and MAY NOT use AI, help from other students / 3rd parties, or external solutions even for reference. 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 essentially 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.

COLLABORATION OR AI USAGE OUTSIDE OF THESE GUIDELINES WILL LEAD TO ACADEMIC INTEGRITY VIOLATIONS AND WILL BE REPORTED TO THE OFFICE OF ACADEMIC INTEGRITY

Academic Integrity Penalties: 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 0 on the assignment or exam and, additionally, a half-letter grade drop (A- to B+). 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. the half letter grade drop).

Contesting Grades: You have AT MOST 1 WEEK after the late submission deadline to contest your grade. However, since almost all of the assignments are auto-graded, there should be little reason for this. To contest your grade, make a private post on our discussion boards with the issue and supporting evidence.

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 (and can be prosecuted even after the course is over).

Portfolio Project

To provide you the experience of writing a program "from scratch" and to give you freedom to apply the concepts taught in class to problems of your own interest, there be one open-ended, team-based project, referred to as a portfolio project, that counts towards two or three of your lab sessions (you must still attend these lab sessions in person). The project will have some loose requirements and guidelines regarding the concepts you are to use, but within those guidelines, you are free to write whatever program you wish. We strongly encourage you to challenge yourself. You will work in teams and your grade will be based on meeting the team-based milestones and an assessment by your lab instructor on the project's correctness. No late submission will be allowed as the portfolio will be due at the end of the semester. These portfolio assignments can also be used to obtain feedback on coding style, efficiency, and practice from your lab cohort and TAs. Finally, these portfolio assignments are YOURS and may be posted publicly and distributed to potential employers or anyone you wish.

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.

We will have roughly 12 labs. During those weeks, labs are graded Credit (CR) / No Credit (NC) based on attendance and completing a specified subset of the lab tasks. Usually, there will then be additional exercises for your benefit. You may leave early if you complete the full lab, but again, you only need to complete the specified portion (usually a smaller subset of exercises) to get FULL credit for the lab. To receive that credit, you MUST check off with your LAB LEADER (human demo).

You may miss 3 labs without penalty. You do NOT need to email or notify your lab leader to use these absences. They will be automatically applied. These are intended for illness or other family travel and not just because you have other assignments due. After missing 3 graded labs, you will lose credit for the lab portion of your grade. No exceptions will be made for additional lab absences without USC Campus Support involvement (i.e. severe medical or family emergency). For any errors in recording your credit, you have 1 week after your grade is posted to contest the issue by reaching out to your lab TA.

Since CS 103 is a large class we encourage you to use your lab section as a means of personal connection with a course staff and, hopefully, some of your fellow students. You can form homework teams (again 2 at most) and larger study groups for exams.

Exams

Time and Location: There will be two midterm exams and one final. The midterm exams will be held during the quiz section on Week 8 and 12. The exams will be in alternative (larger) classrooms. Always check the course website as the listed exam date approaches to confirm the date and time and location. You are responsible for finding out when and where the exams will be held.

Academic Accommodations: If you have USC approved academic accommodations, please schedule a time with the OSAS testing center at least 1 week before the exam AND let the instructor know your starting time.

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. The written exam and final exam will be paper/pen based with more conceptual, tracing, and fill-in-the-blank coding questions. The programming exam is administered via Codio and so you will need a laptop with sufficient battery life. For the programming midterm, you will write your code on Codio. Students that do not do the homework or projects usually fail the programming exam. To contest an exam grade, you have 1 week after the grade is posted. You must use the Gradescope Regrade Request feature to request regrades on written exams.

Grading Timeline

All coursework submitted on Codio is graded automatically and students will get immediate feedback. Exams will be graded within 5-7 school days.

Course Schedule

Below is a detailed course calendar that provides a thorough list of deliverables—readings, assignments, examinations, etc., broken down on a weekly basis. For each unit of in-class contact time, the university expects two hours of out of class student work per week over a semester.

	Topics	Readings	Deliverables
Week 1	Course Overview; C++ Bootcamp (C++ Differences, Functions, Arrays)	1.1-1.5, 2.1-2.4,8.3 3.1-3.7,4	
Week 2	Pass-by-value, pass-by-reference	6.1-6.6, 5.1-5.8	
Week 3	Compilation, Runtime, C-Strings, Pointers Intro and Pass-by-Reference	7.1-7.3	HW 1
Week 4	Dynamic Allocation Pointer Arithmetic; Arrays of Pointers	7.1-7.2,7.4 7.3, 7.5, 7.6	PR 1
Week 5	Command Line Arguments, Deep vs. Shallow Copy	8.5	
Week 6	Object Introduction: Structs and Strings	7.7-7.8, 7.3	HW 2
Week 7	File Streams and User-defined objects **Fall Break - No class**	8.1-8.3, 9.1-9.3 9.4-9.6	PR 2
Week 8	Images, Linked Lists, Midterm Review **Midterm #1 (Written Midterm) during quiz section**	Class Notes	HW 3
Week 9	Reference and Const Parameters Vectors and Deques	5.9, 6.7	HW 4
Week 10	Operator overloading Copy Semantics	Class Slides	
Week 11	Copy semantics, Inheritance	Class Slides	PR 3
Week 12	Inheritance and Polymophism, Midterm Review	10.3-10.4	
Week 13	I/O – Streams and Parsing **Midterm #2 (Programming Midterm) during quiz section**	Class Notes and 8	HW 5
Week 14	Exceptions Binary File I/O	8.5	
Week 15	Recursion Review	5.1	HW 6, PR4
Final	**See schedule of classes for "Execptions Final": Saturday December 13th 11am**		

Academic Integrity

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is contrary to this fundamental mission and includes any act of dishonesty in the submission of academic work (either in draft or final form), as well as cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage. Students are expected to uphold the highest standards of academic integrity in all coursework.

This course follows the expectations for academic integrity as stated in the USC Student Handbook. All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. Students may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of academic misconduct will be reported to the Office of Academic Integrity.

Academic dishonesty has a far-reaching impact and is considered a serious offense against the university. Violations will result in a grade penalty, such as a failing grade on the assignment or in the course, and disciplinary action from the university, such as suspension or expulsion.

For more information about academic integrity see the Student Handbook, 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.]

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. (Living our Unifying Values: The USC Student Handbook, page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study is prohibited. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relation to the class, whether obtained in class, via email, on the internet, or via any other media. Distributing course material without the instructor's permission will be presumed to be an intentional act to facilitate or enable academic dishonesty and is strictly prohibited. (Living our Unifying Values: The USC Student Handbook, page 13).

Course Evaluations

Course evaluations will occur online at the end of the semester using the evaluation system provided by the University.

Statement on University Academic and Support Systems

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 osas.usc.edu. You may contact OSAS at (213) 740-0776 or via email at osasfrontdesk@usc.edu.

Student Financial Aid and Satisfactory Academic Progress:

To be eligible for certain kinds of financial aid, students are required to maintain Satisfactory Academic Progress (SAP) toward their degree objectives. Visit the Financial Aid Office webpage for undergraduate- and graduate-level SAP eligibility requirements and the appeals process.

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 Lifeline consists of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. 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.

CARE-SC: Confidential Advocacy, Resources, and Education Support Center - (213) 740-9355(WELL) – 24/7/365 on call.
Confidential advocates, prevention educators, and professional counseling teams work to promote a universal culture of consent, as well as prevent and respond to sexual assault, intimate partner violence, stalking, or other relationship harm. Services available to all USC students at no cost.

Office of Civil Rights Compliance - (213) 740-5086
Information about how to get help or help someone affected by harassment, discrimination, retaliation on the basis of a protected characteristic, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

USC Report & Response - (213) 740-2500
The USC Report & Response website is the university's central reporting portal for concerns arising in the academic space or workplace. All concerns will be assessed and referred to the appropriate university office for resolution. Any questions about USC Report & Response or reporting, in general, can be referred to the Office of Professionalism and Ethics at ope@usc.edu.

USC Campus Support and Intervention - (213) 740-0411
Focuses on student success by assisting students in navigating and resolving complex issues through problem solving, presenting options, and connecting to resources.

USC Emergency Information
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
For 24 hour emergency assistance or to report a crime: UPC: (213) 740-4321, HSC: (323)-442-1000.
For 24 hour non-emergency assistance or information: UPC: (213) 740-6000, HSC: 323-442-1200.

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.