TAC 365 – Managing Data in C++
Units: 4
Fall 2025

Time: See schedule of courses
Location: See schedule of courses

Instructor: Greg Pohlner
Office Hours: See Piazza
Contact Info: All general course/assignments questions should be asked on Piazza (every student will receive an invitation at the start of the semester).
Other questions should be asked via email: pohlner@usc.edu

Course Description

TAC-365 teaches students the fundamentals of C++ and Data Structures in C++. We will explore many types of Data Structures across the semester. Students will learn how to evaluate a problem and choose the appropriate supporting Data Collections to solve the problem.

Learning Objectives

- Understand C++ programming fundamentals including variables, control statements, loops, arrays, pointers, functions, and object-oriented programming
- Learn the process of how data structures are implemented
- Learn the mechanisms used to evaluate the performance of various algorithms
- Learn problem-solving through advanced recursion and parallelism
- Learn how and when to use a variety of core data structures

Prerequisite(s): TAC-265

Course Notes

Lecture slides and assignments will all be posted on Brightspace. Course discussions will occur on Piazza. Assignments will be submitted through GitHub.

Lectures will feature in-class polls conducted via PollEverywhere. Students can respond to these polls via their mobile device or laptop.

Technological Proficiency and Hardware/Software Required

Students should have access to their own computer running either Windows or MacOS and should be familiar with the basic operation of their computer.

Required Readings and Supplementary Materials

Optional: Malik, D.S.. *C++ Programming: Program Design including Data Structures 8th Edition.* Cengage Learning. 2017. ISBN-10: 9781337117562.

Additional readings such as excerpts from other books or online articles will be provided on Brightspace.

Description and Assessment of Assignments

Tentatively, there are ten different homework assignments in this course. Students will have between one and two weeks to complete each homework assignment. Students are expected to complete these programming assignments *individually*. Each assignment's instructions include a grading rubric for that assignment.

Exams

There is a midterm exam and a final exam. All exams are cumulative.

Grading Breakdown

Item	% of Grade
Assignments	60
Midterm	20
Final	20
Total	**100**

Grading Scale (Example)

Course final grades will be determined using the following scale

A 93-100
A- 90-92
B+ 87-89
B 83-86
B- 80-82
C+ 77-79
C 73-76
C- 70-72
D+ 69
D 67-69
D- 66
F 65 and below

Half percentage points will be rounded up to the next whole percentage. For instance, 89.5% is an A-, but 89.4% is a B+.

Assignment Submission Policy

Programming assignments must be submitted to student's GitHub repositories by the deadline or they will be considered late. Programming assignments that do not compile on GitHub will receive a 0. Information about GitHub is provided in the first week of class.

Late Policy

Programming assignments will be accepted up to two days late. Assignments submitted within 24 hours after the due date receive a 20% deduction. Assignments submitted before 48 hours of the due date receive 50% deduction. Extensions are only provided in the event of a documented reason satisfactory to the instructor, such as an illness or emergency.

Make-up Policy for Exams
To make up for a missed exam, the student must provide a satisfactory reason (as determined by the instructor) along with documentation. Make-up exams are only allowed under extraordinary circumstances.

Grading Issues
Students will have one week after graded feedback is given to contest scores (e.g. assignments and exams). After that week scores will not be changed.

Plagiarism and Individual Work Policy
In this class, programming assignments are expected to represent the individual effort of each student. All programming assignment submissions will be compared with current, previous, and future students' submissions using plagiarism identification software. If your code significantly matches another student's submission, you will be referred to OAI with a recommended penalty of an F in the course.

Students may discuss solutions to specific problems with other students but may not look through another person's code. It does not matter if this code is online or from another student. Do not share your code with anyone else in this or a future section of the course, as allowing someone else to copy your code carries the same penalty as copying the code yourself.

Course Material Policy
Do not reproduce, distribute, or post any lecture material, assignments, assignment solutions, or exams publicly without the written consent of the instructor. You may take notes and make copies of course materials for your own use. You may not post course materials on sites like CourseHero. Doing so is a copyright violation and in some cases may also be an academic integrity violation that will be dealt with accordingly. Except where otherwise noted, the lecture notes and assignment instructions for this course are © 2024 Sanjay Madhav, Nathan Greenfield, and Gregory Pohlner

Course Schedule: A Weekly Breakdown (Tentative)

	Topics	Work assigned
Week 1	Introduction getting up to speed with C++	
	Functions and files	HW1
Week 2	Debugging	
	Dynamic memory	
Week 3	Object-oriented C++ (p1)	HW2
	Object-oriented C++ (p2)	
Week 4	Operator overloading	HW3
	C++ linear data structures	
Week 5	Big-O	
	Intro to recursion	
Week 6	Using recursion	HW4
	C++ Graphics	
Week 7	Review	
	Review	
Week 8	**Midterm**	
	About C++ data structures	HW5
Week 9	Vectors (p1)	
	Vectors (p2)	HW6
Week 10	Linked lists (p1)	
	Linked lists (p2)	HW7
Week 11	Iterators	
	Binary search trees	HW8
Week 12	Tree traversal	
	Other trees	HW9
Week 13	Hash maps	
	Graphs	
Week 14	Graph traversal	HW10
	Dijkstra's algorithm	
Week 15	Data representations	
	Review	
FINAL	Date: For the date and time of the final for this class, consult the USC *Schedule of Classes* at www.usc.edu/soc.	

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else's ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, "Behavior Violating University Standards" policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call
studenthealth.usc.edu/counseling
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.
National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.
Relationship and Sexual Violence Prevention and Services (RSVP) - (213) 740-9355(WELL), press "0" after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED)- (213) 740-5086 | Title IX – (213) 821-8298
equity.usc.edu, titleix.usc.edu
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. The university prohibits discrimination or harassment based on the following *protected characteristics*: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations. The university also prohibits sexual assault, non-consensual sexual contact, sexual misconduct, intimate partner violence, stalking, malicious dissuasion, retaliation, and violation of interim measures.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298
usc-advocate.symplicity.com/care_report
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity |Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu
Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710
uscsa.usc.edu
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101
diversity.usc.edu
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
dps.usc.edu, emergency.usc.edu
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) 442-120 – 24/7 on call
dps.usc.edu
Non-emergency assistance or information.