
Object-Oriented Programming and Advanced Data Structures

DEPARTMENT OF COMPUTER ENGINEERING, SANTA CLARA UNIVERSITY, CALIFORNIA

Tuesday and Thursday 8:30 – 10:10 AM

Summary of the Course

Object-oriented specification, design, and implementation of data structures with emphasis on software reliability and reusability; Design and implementation of static and dynamic data structures such as bag, sequence, vector, list, stack, queue, deque, priority queue, set, multiset, map, multimap, and graphs; Software development with templates, iterators, and the STL; Derived classes and inheritance; Memory allocation and performance; Using data structures in real-world applications; Time analysis of data structures; Informal use of specifications to guide implementation and validation of programs.

Course Outcome

1. Design and develop static and dynamic ADTs using object-oriented concepts such as encapsulation, operator overloading, inheritance, template functions/classes and iterators.
2. Given a problem description: Identify/compare/contrast appropriate ADTs to use in the solution, including evaluating multiple options for representation of the chosen ADT; Define and evaluate multiple options for implementation of the chosen representation.
3. Understand the implementation of data structures in an object-oriented programming language.
4. Design and develop test programs to test ADTs using methods such as testing boundary conditions and fully exercising code.
5. Effectively serve in various roles as part of a team to complete lab assignments.

Professor

Dr. Farokh Eskafi, Email: feskafi@scu.edu

Office: (home on video!) my video link is 11to.me/cubguky on any browser

Office Hours:

- Wednesday 2-4 PM or by appointment

Teaching Assistants

- Antonio Gigliotti (agigliotti@scu.edu)

Text Book

Data Structures and other Objects using C++, by Michael Main, Walter Savitch, 4th Edition

Supplementary Book

Data Structures and Algorithm Analysis in C++, by Mark A. Weiss, 4th Edition

Prerequisites: A grade of C- or better in either CSE 12 or CSCI 61 and in either CSE 19 or MATH 51. Co-requisite: CSE 79L

- **Changes to Syllabus:** Any additions or modifications will be posted to Camino.
- **Announcements:** Announcements will be posted to Camino.

Tentative Schedule

Week 1:	OOP, Phases of Software Dev
Week 2	Analysis, abstract Data Types and Classes
Week 3:	Container Classes, Quiz 1
Week 4:	Pointers and Dynamic Arrays, Linked Lists
Week 5:	Templates, Quiz 2
Week 6:	Iterators, Stacks
Week 7:	Queues, Quiz 3
Week 8:	Trees
Week 9:	Balanced Trees, Quiz 4
Week 10:	Derived Classes, Inheritance

Grading

CSE 79L

- 10 points: participations
- 90 points: Projects
 - 20 points: Commenting and style
 - 70 points: Correctness

You can discuss with others during the lab hours for debugging assistance. However, all changes to your code must be made by you. You are not allowed to share your solutions with others. If you are aware of students violating this policy, you are encouraged to inform the TA and the professor of the course.

Lab grade does not directly affect the course grade. However, the material covered in the lab is meant to reinforce the material presented in class.

CSE 79

- 25 points: Assignments (posted to Camino)
- 40 points: Quizzes – (during the class hours)
- 5 points: attendance and participation in discussions and class
- 5 points: your lab grade
- 25 points: Final Exam (or Final project TBD)
- Total: 100 points

Late submissions (for 79 and 79L).

- It is better to submit what you have than late submission
- **50%** of the actual score will be taken off for assignments submitted between 1 and 24 hours after the deadline.
- No assignments will be accepted after that.

Exams

- Quizzes: All quizzes will be closed-book exams covering all materials up to that point in the course.

- **Final:** The final exam will be a closed-book exam, covering all the course materials.

You are not allowed to get help from your phone/laptop/tablet during the exams.

Make-up exams: Make-up exams will not be offered except in extreme cases, you should submit valid documentation. Not knowing the correct date, time or location of an exam are not valid reasons for missing an exam. You will get a zero if you miss the exam and fail to submit valid documentation. Make-up exams are harder as it provides a student with extra time to prepare for the test.

Re- grading: If you think that your project has been mis-graded and deserves a regrading: see the class TA first, and then the professor, if you are unhappy with the TA's response.

Grades will be based on absolute scores, and there will be no curving.

[Class attendance](#)

I strongly recommend that you attend the classes or listen to the recorded lectures. Not all the lecture materials are available in the slides.

Important resources to prepare for the exams: (1) class notes, (2) slides, (3) assignments, (4) lab projects.

Academic Integrity Pledge

The Academic Integrity pledge is an expression of the University's commitment to fostering an understanding of -- and commitment to -- a culture of integrity at Santa Clara University. The Academic Integrity pledge, which applies to all students, states:

I am committed to being a person of integrity. I pledge, as a member of the Santa Clara University community, to abide by and uphold the standards of academic integrity contained in the Student Conduct Code

Students are expected to uphold the principles of this pledge for all work in this class.

A student who is guilty of a dishonest act in an examination, paper, or other work required for a course, or who assists others in such an act, may, at the discretion of the instructor, receive a grade of "F" for the course. In addition, a student found guilty of a dishonest act may be subject to sanctions, up to and including dismissal from the University, as a result of the student judicial process as described in the Student Handbook. A student who violates copyright laws, including those covering the **copying of software programs**, or who knowingly alters official academic records from this or any other institution is subject to similar disciplinary action.

Disabilities Resources

If you have a disability for which accommodations may be required in this class, please contact Disabilities Resources, Benson 216, <http://www.scu.edu/disabilities> as soon as possible to discuss your needs and register for accommodations with the University. If you have already arranged accommodations through Disabilities Resources, please discuss them with me during my office hours. Students who have medical needs related to pregnancy may also be eligible for accommodations.

While I am happy to assist you, I am unable to provide accommodations until I have received verification from Disabilities Resources. The Disabilities Resources office will work with students and faculty to arrange proctored exams for students whose accommodations include double time for exams and/or assisted technology. (Students with approved accommodations of time-and-a-half should talk with me as soon as possible). Disabilities Resources must be contacted in advance to schedule proctored examinations or to arrange other accommodations. The Disabilities Resources office would be grateful for advance notice of at least two weeks. For more information you may contact Disabilities Resources at [408-554-4109](tel:408-554-4109).

Accommodations for Pregnancy and Parenting

In alignment with Title IX of the Education Amendments of 1972, and with the California Education Code, Section 66281.7, Santa Clara University provides reasonable accommodations to students who are pregnant, have recently experienced childbirth, and/or have medically related needs. Pregnant and parenting students can often arrange accommodations by working directly with their instructors, supervisors, or departments. Alternatively, a pregnant or parenting student experiencing related medical conditions may request accommodations through Disability Resources.

Discrimination and Sexual Misconduct (Title IX)

Santa Clara University upholds a zero-tolerance policy for discrimination, harassment and sexual misconduct. If you (or someone you know) have experienced discrimination or harassment, including sexual assault, domestic/dating violence, or stalking, I encourage you to tell someone promptly. For more information, please consult the University's Gender-Based Discrimination and Sexual Misconduct Policy at <http://bit.ly/2ce1hBb> or contact the University's EEO and Title IX Coordinator, Belinda Guthrie, at [408-554-3043](tel:408-554-3043), bguthrie@scu.edu. Reports may be submitted online through <https://www.scu.edu/osl/report/> or anonymously through Ethicspoint <https://www.scu.edu/hr/quick-links/ethicspoint/>