



1 Website

<https://www.swamiiyer.net/cs210/> 

2 Course Description

The design and implementation of computer programs in a high-level language, with emphasis on proper design principles and advanced programming concepts, including dynamic data structures and recursion. Efficient design, implementation and debugging techniques are stressed. The assignments are designed to introduce the student to a variety of topics in computing: data structures and ADTs, Lists, Stacks, Queues, Ordered Lists, Binary Trees, and searching and sorting techniques.

Prerequisites: CS110  with a grade of C- or better; or permission of the instructor.

Students who successfully complete this course will be able to confidently implement, debug, and put a wide variety of algorithms and data structures to work in computational problems that they might encounter later in their careers. The course covers fundamental material that will be of value to students interested in science, mathematics, and engineering.

3 Text

Algorithms  by Robert Sedgewick and Kevin Wayne

The text provides an excellent survey of the most important algorithms and data structures in use today, motivating each algorithm by examining its impact on applications to science, engineering, and industry.



4 Topics Covered

- Course Mechanics
- Programming Environment
- Fundamentals
 - Programming Model
 - Data Abstraction
 - Analysis of Algorithms
 - Basic Data Structures
 - Union-find
- Sorting
 - Elementary Sorts
 - Merge Sort
 - Quick Sort
 - Priority Queues
 - Applications
- Searching
 - Symbol Tables

- Binary Search Trees
- Balanced Search Trees
- Hash Tables
- Applications
- Graphs
 - Undirected Graphs
 - Directed Graphs
 - Minimum Spanning Trees
 - Shortest Paths

5 Grading

Students' final grades are determined as follows:

Assessment	% of Final Grade
Exercises (best 5 out of 6)	5
Projects (best 5 out of 6)	20
Exams (1 and 2) [†]	70
Attendance	5

[†] If you score at least 80% on both exams, the higher of the two scores will be considered as your exam average.

6 Academic Honesty

If you are caught cheating on a project/exam and if it is your first offense, you will receive a 0 for that project/exam, and you will be reported to the appropriate department official. If you repeat this behavior and are caught again, you will receive an F for the course and you will be reported to the appropriate university personnel. Regrettably, this has happened quite often and is always extremely unpleasant.

7 Accomodations for Students with Disabilities

Section 504 of the Americans with Disabilities Act of 1990 offers guidelines for curriculum modifications and adaptations for students with documented disabilities. If applicable, students may obtain adaptation recommendations from the Ross Center for Disability Services [↗](#). The student must present these recommendations and discuss them with the instructor within a reasonable period, preferably by the end of Add/Drop period.