San Jose State University
Department of Computer Science
CS146, Data Structures and Algorithms, Section 4
Fall Semester 2015

Course and Contact Information

Instructor: Dr. Saroj Sabherwal

Office Location: DH 282

Telephone: 408-924-5097

E-mail: saroj.sabherwal@sjsu.edu

Office Hours : Wednesday5:45- 7:00 PM

and available on-line or by appointment

Course Days/Time: MW 4:30-5:45 PM

Classroom: MH-222

Prerequisite: Math 30, Calculus, Math 42,

Discrete Mathematics,

CS 46B, Introduction to Data

Structures

CS 49J Programming in Java

(or equivalent knowledge of

Java)

Course Description

"Implementations of advanced tree structures, priority queues, heaps, directed and undirected graphs. Advanced searching and sorting (radix sort, heapsort, mergesort, and quicksort). Design and analysis of data structures and algorithms. Divide-and conquer, greedy, and dynamic programming algorithm design techniques." 3 units

Learning Outcomes

Upon successful completion of this course, you should be able to:

1. SLO 1 Implement lists, stacks, queues, search trees, heaps, union-find ADT, and graphs and use these data structures in programs they design
2. SLO 2 Prove basic properties of trees and graphs
3. SLO 3 Perform breadth-first search and depth-first search on directed as well as undirected graphs
4. SLO 4 Use advanced sorting techniques (radix sort, heapsort, mergesort, quicksort)
5. SLO 5 Determine the running time of an algorithm in terms of asymptotic notation
6. SLO 6 Solve recurrence relations representing the running time of an algorithm designed using a divide- and-conquer strategy
7. SLO 7 Comprehend the basic concept of NP-completeness and realize that they may not be able to efficiently solve all problems they encounter in their careers
8. SLO 8 Comprehend algorithms designed using greedy, divide-and-conquer, and dynamic programming techniques

Required Texts/Readings

Textbook:

Data Structures and Algorithm Analysis in Java by Mark Allen Weiss, 3rd edition

Publisher; Pearson
ISBN: 13-978-0-13-257627-7

Requirements and Assignments

SJSU classes are designed such that in order to be successful, it is expected that students will spend a minimum of forty five hours for each unit (normally three hours per unit per week), including preparing for class, participating in course activities completing assignments and so on. More details about student t workload can be found in University Policy S12 -3 at http:///www.sjsu.edu/senate/docs/S12 -3 .pdf

There will a homework assignment for each major topic we study in this course. These include assignments for Complexity analysis, Lists and Stacks, Trees, Hashing, sorting, graph and algorithms. The schedule of class below indicates the due date, assignment weights and how much each assignment is aligned with the learning outcomes.

NOTE that University Policy F69 =24 at http://www.sjsu.edu/senate/docs/F69 -24.pdf states that student should attend all meetings of their classes, not because they are responsible for material discussed therein, but active participation is frequently essential to ensure maximum benefits for all members of the class. Attendance per se shall not be used as a criterion for grading.

Grading Policy

Make-up Exam

Make-up exams are possible under exceptional circumstances.

Grading

Homework	50%
Tests	30%
Final Exam	20%

Course Grading Standards

Each test and homework is graded out of 100 points. A late home work will be deducted 20 points from the grade, if it is late by 24 hours, later than that will not be accepted.

At the end all grades will be assigned a letter grade of:
A for the average score of 90-100,
B for the average score of 80 – 90,
C for the average score of 79 – 80
Rest of the students will be assigned a grade of D or F depending on their class performance.

Note that " All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for determination of their course grades" See University Policy F 13 -1 at http://www.sjsu.edu/senate/docs/F13-1.pdf for more details.

Classroom Protocol

Students are expected to participate in all the lectures, so you need to turn of your cell phones during lecture time.

University Policies

General Expectations, Rights and Responsibilities of the Student

As members of the academic community, students accept both the rights and responsibilities incumbent upon all members of the institution. Students are encouraged to familiarize themselves with SJSU's policies and practices pertaining to the procedures to follow if and when questions or concerns about a class arises. See University Policy S90–5 at http://www.sjsu.edu/senate/docs/S90-5.pdf. More detailed information on a variety of related topics is available in the SJSU catalog, at http://info.sjsu.edu/web-dbgen/narr/catalog/rec- 12234.12506.html. In general, it is recommended that students begin by seeking clarification or discussing concerns with their instructor. If such conversation is not possible, or if it does not serve to address the issue, it is recommended that the student contact the Department Chair as a next step.

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's Catalog Policies section at http://info.sjsu.edu/static/catalog/policies.html. Add/drop deadlines can be found on the current academic year calendars document on the Academic Calendars webpage at http://www.sjsu.edu/provost/services/academic_calendars/. The Late Drop Policy is available at http://www.sjsu.edu/aars/policies/latedrops/policy/. Students should be aware of the current deadlines and penalties for dropping classes.

Information about the latest changes and news is available at the Advising Hub at http://www.sjsu.edu/advising/.

Consent for Recording of Class and Public Sharing of Instructor Material

University Policy S12-7, http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain instructor's permission to record the course and the following items to be included in the syllabus:

• "Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private, study purposes only. The recordings are the intellectual property of the instructor; you have not been given any rights to reproduce or distribute the material."

- In classes where active participation of students or guests may be on the recording, permission of those students or guests should be obtained as well.
- It is suggested that the green sheet include the instructor's process for granting permission, whether in writing or orally and whether for the whole semester or on a class by class basis.
- "Course material developed by the instructor is the intellectual property of the instructor and cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor consent.

Academic integrity

Your commitment, as a student, to learning is evidenced by your enrollment at San Jose State University. The University Academic Integrity Policy S07-2 at http://www.sjsu.edu/senate/docs/S07-2.pdf requires you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The Student Conduct and Ethical Development website is available at http://www.sjsu.edu/studentconduct/.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. Presidential Directive 97-03 at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the Accessible Education Center (AEC)

Schedule

Subject to change!

Weeks	Topics and activities	Dates	Chapters
1	Intro From arrays to Generics Algorithm analysis	Aug 24,26	1,2
2	Algorithm analysis	Aug 31,Sept. 2	2
3	Lists	Sept. 7, 9	3
4	Stacks and queues	Sept 14,16	3
5	Trees	Sept 21,23	4
6	Trees	Sept 28,30	4
7	Priority queues (heaps)	Oct 5,7	6
8	Midterm Review Midterm I	Oct 12,14	7
9	Sorting	Oct 19,21	7
10	Sorting Disjoint set class	Oct 26,28	7, 8
11	Graphs	Nov 2, 4	9
12	Graphs	Nov 9,11	9
13	Hashing	Nov 16,18	5
14	String pattern matching Midterm II	Nov 23,25	10
15	Algorithm design techniques	Nov 30,Dec. 2	10
16	NP-completeness Special Topics	Dec 2,7	9, 12