San José State University

Course and Contact Information

Instructor:	Aniket Chandak
Office Location:	DH 282
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Office Hours:	Tu/Th 3:15 PM 4:15 PM
Class Days/Time:	Tu/Th 4:30-5:45pm
Classroom:	SH 100

Course Format

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found on my faculty web page at http://www.sjsu.edu/people/firstname.lastname and/or on Canvas Learning Management System course login website at http://sjsu.instructure.com. You are responsible for regularly checking with the messaging system through MySJSU at http://my.sjsu.edu (or other communication system as indicated by the instructor) to learn of any updates.

Prerequisite

MATH 42, MATH 30, CS 46B, and CS 49J (or equivalent knowledge of Java) (with a grade of "C-" or better in each); Computer Science, Applied and Computational Math or Software Engineering majors only; or instructor consent

Course Description

1. Understand the implementation of lists, stacks, queues, search trees, heaps, union-find ADT, and graphs and be able to use these data structures in programs they design
2. Prove basic properties of trees and graphs
3. Perform breadth-first search and depth-first search on directed as well as undirected graphs
4. Use advanced sorting techniques (heapsort, mergesort, quicksort)
5. Determine the running time of an algorithm in terms of asymptotic notation
6. Solve recurrence relations representing the running time of an algorithm designed using a divide-and-conquer strategy
7. Understand 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. Understand algorithms designed using greedy, divide-and-conquer, and dynamic programming techniques

Required Texts/Readings

Textbook

Recommended reading:

Algorithms, 4th Edition by Robert Sedgewick and Kevin Wayne

Addison-Wesley Professional, 2011, ISBN 0-321-57351-X.

https://www.amazon.com/dp/032157351X/

Introduction to Algorithms, 3rd Edition Cormen, Leiserson, Rivest, and Stein
ISBN-10: 0262033844ISBN-13: 978-0262033848MIT Press, 2009
https://www.amazon.com/Introduction-Algorithms-3rd-MIT-Press/dp/0262033844
You can find errata (bug reports) for the book http://www.cs.dartmouth.edu/~thc/clrs-bugs/bugs-3e.php,for whichever printing of the book you get.

Optional reading:

Introduction to Programming in Java: An Interdisciplinary Approach, 1st Edition by Robert Sedgewick and Kevin Wayne

ISBN-13: 978-0321498052

https://www.amazon.com/gp/product/0321498054/

Programming Environment

http://algs4.cs.princeton.edu/home/

Course 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 of credit (normally three hours per unit per week), including preparing for class, participating in course activities, completing assignments, and so on. More details about student workload can be found in University Policy S12-3at http://www.sjsu.edu/senate/docs/S12-3.pdf.

Homework assignments will be individual, regularly assigned, will include written problem assignments, and perhaps some online exercises. Solutions will be not posted all the time. The homework is a tool for you to learn the material and prepare you for the exams.

Midterm exams:

There will be two Midterm exams during the semester.

Final Examination:

One written final cumulative exam.
Section 7: Day: May 13 Time: 14:45-17:00

The exams will contain multiple choice questions, short answer questions and questions that require pseudocode and/or computations. Students must obtain >50% in each component of the course (homework, project, quizzes & written exams) in order to be eligible for a passing grade.

Grading Information
Your grade for the course will be based on the following components:

Mid Term Exams - 30%
Final Exam - 25 %
Projects 20 %
Assignments 20%
Discretion - 5% (Including participations in class, answering forum posts on Piazza)

Exams are closed book; final exam is comprehensive. No extra point options in the final. No make-ups exams except in case of verifiable emergency circumstances

Determination of Grades
The following shows the grading scale to be used to determine the letter grade:

Percentage	**Grade**
95 and above	A+
92-94	A
90 - 91	A-
87 - 89	B+
83 - 86	B
80 - 82	B-
77 - 79	C+
73 - 76	C
70 - 72	C-
67 - 69	D+
63-66	D
60-62	D-
59 and below	F

code, the better you will become.
Always keep testing your code. After ever few lines of coding, test and compile your code. It is easy to find mistakes in a small scope. And remember to back up your code while you are working on it. I recommend saving it in the cloud.
As the course is challenging, and required a significant time commitment for most students, ask your instructor for help, ask your friends on Piazza, but there is no excuse for plagiarism.

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	1/23	Introduction, Course mechanic & Logistics
1	1/28	Programming Model (Reading: SW 1.1)
2	1/30	Data Abstraction (Reading: SW 1.2)
2	2/4 (drop)	Basic Data Structures (Reading: SW 1.3)

Basic Data We