San José State University
Department of Computer Science
CS 146, Data Structures and Algorithms, 4, Fall, 2016

Course and Contact Information

Instructor:	Margareta Ackerman
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Office Hours:	M 12:30-1:30, W 4:30-5:30
Class Days/Time:	MW 3:00-4:15
Classroom:	MacQuarrie Hall 225
Prerequisites:	Math 030 Calculus I Math 042 Discrete Mathematics CS 049J Programming in Java or equivalent knowledge of Java CS 046B Introduction to Data Structures

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, notes, assignment instructions, etc. can be found on Canvas Leaning 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 to learn of any updates.

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

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

- Analyze the running time of algorithms using asymptotic notation
- Implement search trees, heaps, and graphs and use these data structures in programs they design
- Perform breadth-first search and depth-first search
- Use advanced sorting techniques
- Solve recurrence relations representing the running time of an algorithm designed using a divide-and-conquer strategy
- 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
- Comprehend algorithms designed using greedy, divide-and-conquer, and dynamic programming techniques

Required Texts/Readings

Cormen, T.H.; Leiserson, C.E; Rivest, R.L.; and Stein, C. (2009). Introduction to Algorithms (3rd ed.). MIT Press, Cambridge, MA. ISBN 978-0-262-03384-8

Course Requirements and Assignments

Here is a preliminary schedule for assignment due dates. Please note that these dates are subject to change.

-Assignment 1: September 14th
-Assignment 2: September 28th
-Assignment 3: October 26th
-Assignment 4: November 16th
-Assignment 5: December 7th

Final Examination or Evaluation

The final exam will be held on Monday, December 19 at 12:15-14:30.

Grading Information

Assignments: 40% (3 written, 2 programming, worth 8% each).
Midterm: 20% (October 5th)
Final: 40%

Marks will be calculated out of 100 and converted to letter grades as follows.

A	85-100
A-	80-84
B+	77-79
B	73-76
B-	70-72
C+	67-69
C	63-66

C- 60-62
D+ 57-59
D 53-56
D- 50-52
F 0-49

Classroom Protocol

It is important for each student to attend classes and to participate.

University Policies

Per University Policy S16-9, university-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/"

CS 146 / Data Structures and Algorithms, Fall 2016, Course Schedule

The schedule is subject to change.

Course Schedule

Week	Date	Topics, Readings, Assignments, Deadlines
1	Aug 24	Introduction
2	Aug 29	Introduction to asymptotic analysis
2	Aug 31	Introduction to asymptotic analysis
3	Sep 5	Labor day - campus closed
3	Sep 7	Advanced asymptotic notation and algorithm analysis
4	Sep 12	Advanced asymptotic notation and algorithm analysis
4	Sep 14	Basic sorting algorithms
5	Sep 19	Divide and conquer, recurrence relations
5	Sep 21	Divide and conquer, recurrence relations
6	Sep 26	Advanced sorting

Week	Date	Topics, Readings, Assignments, Deadlines
6	Sep 28	Advanced sorting
7	Oct 3	Graphs
7	Oct 5	**Midterm Exam**
8	Oct 10	Graphs
8	Oct 12	Breadth-first-search and depth-first-search
9	Oct 17	Search trees
9	Oct 19	Search trees
10	Oct 24	Search trees
10	Oct 26	Search trees
11	Oct 31	Hashing
11	Nov 2	Hashing
12	Nov 7	Reductions and NP-completeness
12	Nov 9	Reductions and NP-completeness
13	Nov 14	Reductions and NP-completeness
13	Nov 16	Reductions and NP-completeness
14	Nov 21	Reductions and NP-completeness
14	Nov 23	Dynamic programming
15	Nov 28	Dynamic programming
15	Nov 30	Dynamic programming
16	Dec 5	Greedy algorithms
16	Dec 7	Greedy algorithms

Week	Date	Topics, Readings, Assignments, Deadlines
17	Dec 12	Review
Final Exam		Monday, December 19 at 12:15-14:30