San José State University
Computer Science Department
CS255, Section 2, Design and Analysis of Algorithms, Fall 2017

Course and Contact Information

Instructor: Chung-Wen (Albert) Tsao

Office Location: DH 282

Telephone: use email

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Office Hours: TTh 05:45-06:30 pm or by appointment

Class Days/Time: TTh 04:30-05:45pm

Classroom: MH 225

Prerequisites: CS 155 or instructor consent

Course Format

Faculty Web Page and MYSJSU Messaging

Course materials such as syllabus, handouts, 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 (or other communication system as indicated by the instructor) to learn of any updates.

Course Description

Randomized algorithms. Parallel algorithms. Distributed algorithms. NP-completeness of particular problems. Approximation algorithms. Selected applications based on students' inputs

Course Learning Outcomes (CLO)

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

1. CLO 1. Code an example of each of the following types of algorithms:

a. Randomized

b. Parallel

c. Approximation

2. CLO 2. Conduct an amortized analysis.

3. CLO 3. Explain how above techniques are used in several applications, and describe what benefits they have within those applications.

Required Texts/Readings

Textbook

No required textbook we will use chapters from various books:
1. Cormen, Leiserson, Rivest and Stein, Introduction to Algorithms, 3rd Edition MIT Press, 2009. You can find errata (bug reports) for the book http://www.cs.dartmouth.edu/~thc/clrs-bugs/bugs-3e.php.

2. Kleinberg and Tardos, Algorithm Design, First edition, Addison Wesley, 2005.

3. Dasgupta, Papadimitriou and Vazirani, Algorithms, McGraw-Hill, 2006.

4. Vazirani, Approximation Algorithms, Springer, 2003

Other Readings

- Horstmann and Cornell, Core Java, Vol. I, Ninth edition, Prentice Hall, 2013.
- Research papers
- Handouts (through Canvas)

Other equipment / material requirements

Java Compiler (version 7 or later).

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 S12-3 at http://www.sjsu.edu/senate/docs/S12-3.pdf.

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

Reading assignments: Reading assignments will regularly be for the next class.

Quizzes: Unannounced quizzes may be given during class, each taking about 5 minutes total or online. These will generally be problems from the reading assignment and/or the homework.

Project (Programming and Presentation): A programming project of your choice related to the course in groups of two students. At the end of the semester you will present the project in the class. Never use any code you find on the web, unless it is given by me. Penalty for late submission 5% for every 3 days up to 9 days, after that no submission will be accepted. Never email your assignments.

Midterm exams: There will be two written Midterm exams during the semester.

Final exam: One written final cumulative exam.

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 Policy

Final Grade:
25% Project (programming and presentation)
15% Quizzes/Homework
30% Midterms (15% each)
30% Final

Exams are closed book, final exam is comprehensive.
No make-ups exams except in case of verifiable emergency circumstances

A 92.5%	C 72.5%
A- 90.0%	C- 70.0%
B+ 87.5%	D+ 67.5%
B 82.5%	D 60.0%
B- 80.0%	F lower than 60%
C+ 77.5%	

Classroom Protocol

Attendance is highly recommended. Please avoid disturbing the class: turn-off cell phones (or put them on vibrate mode), no text messaging in the class or the exams, **no taking pictures and video**, avoid coming late. You may not publicly share or upload material for this course such as exam questions, lecture notes, or solutions without my consent.

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/

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The schedule is subject to change with fair notice.

Course Schedule

Lectures	Date	Topic
1.	8/24	Introduction: Info & Algorithms, Examples
2.	8/29,8/31	Examples, Growth of functions- O, Ω, Θ, o, ω
3.	9/5, 9/7	Graphs
4.	9/12-9/14	Greedy technique
5.	9/19-9/21	Divide and Conquer technique
6.	9/26,9/28	Dynamic Programming technique
7.	10/3,10/5	**Midterm 1 , Network Flow**
8.	10/10, 10/12	Network Flow, Heaps
9.	10/17, 10/19	Hashing

10.	10/24,10/26	Amortized Analysis
11.	10/31-11/2	Randomized Algorithms, Intractability
12.	11/7,11/9	**Midterm 2,** Intractability
13.	11/14,11/16	Intractability, Approximation Algorithms
14.	11/21, ~~11/23~~	Approximation Algorithms, (Thanksgivings)
15.	11/28,11/30	Distributed Algorithms, Project Presentations
16.	12/5,12/7	Project Presentations
17.	12/13	**Final exam** Wednesday, 14:45-17:00pm