SJSU SAN JOSÉ STATE UNIVERSITY

College of Science · Computer Science

Design and Analysis of Algorithms Section 02
CS 255

Spring 2023   3 Unit(s)   01/25/2023 to 05/15/2023   Modified 01/25/2023

👤 Contact Information

Instructor(s):	Dr. Chung-Wen (Albert) Tsao
Office Location:	Duncan Hall Room 282
Telephone:	N/A
Email:	chung-wen.tsao@sjsu.edu (Once the class starts, use Canvas Inbox)
Class Days/Time:	T/Th 10:30 – 11:45 am
Classroom:	Sweeney Hall 435
Office Hours:	M/W 1:00 –1:30pm (on ZOOM at https://sjsu.zoom.us/j/87620744697) M/W 3:00 – 3:30pm (on ZOOM at the same URL link above) T/Th 3:00 – 3:30pm (on ZOOM at th same URL link above) T/Th 3:30 – 4:00pm (Duncan Hall Room 282)

💻 Course Description and Requisites

Randomized algorithms. Parallel algorithms. Distributed algorithms. NP-completeness of particular problems. Approximation algorithms.

Prerequisite(s): CS 155 and Graduate standing. Allowed Declared Major: Computer Science, Bioinformatics, Data Science. Or instructor consent.

Letter Graded

✳ Classroom Protocols

Classroom Protocol and Other Notes

- **Missing the first two lectures and quizzes may be dropped out from the class by the instructor.**
- Do not ask for special treatment. The rules for this course apply to everyone equally.
- Cheating will not be tolerable; a ZERO will be given to any cheated assignment/exams, and it will be reported to the Department and the University.
- Do NOT share/post online any course materials, PPT slides, or homework solutions.

- Use of electronic devices during exams is NOT allowed unless stated otherwise.
- You are required to check Canvas for reading/assignments.
- The information on this syllabus is subject to change; changes, if any, will be clearly explained in class, and it is your responsibility to become aware of them.
- Once the class starts, use Canvas Inbox to email me for a faster response. I check the Canvas Inbox emails much more often than my school emails.

Program Information

Diversity Statement - At SJSU, it is important to create a safe learning environment where we can explore, learn, and grow together. We strive to build a diverse, equitable, inclusive culture that values, encourages, and supports students from all backgrounds and experiences.

Course Learning Outcomes (CLOs)

Course Learning Outcomes (CLO):

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

- CLO 1. Code an example of each of the following types of algorithms:
  - Randomized
  - Parallel
  - Approximation
- CLO 2. Conduct an amortized analysis.
- CLO 3. Explain how above techniques are used in several applications and describe what benefits they have within those applications.

Course Materials

Required Text:

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

Optional Text:

- Anany Levitin, The Design & Analysis of Algorithms (3r d edition), 3rd edition, 2003

Course Requirements and Assignments

Assignments:

- **No late assignments will be accepted without advanced arrangement with the instructor.**
- At the end of the semester, two 24-hour late passes may be applied to two submissions that are not later than 24 hours.
- All homework must clearly indicate each student's name, course, and assignment number.
- Students are allowed (and actively encouraged) to form study groups.
- You may discuss solutions, but you MUST write up the answers independently.
- If you use a website or reference book, you must cite it.
- If there are multiple similar submissions not exhibiting independent thought, or with words obviously lifted from a book or website, ALL such submissions will receive scores of 0.

LockDown Browser + Webcam Requirement:

This course requires the use of LockDown Browser and a webcam for online quizzes. The webcam can be the type that's built into your computer or one that plugs in with a USB cable. Watch this brief video to get a basic understanding of LockDown browser and the webcam feature. Download and install LockDown browser from here.

Pop Quizzes:

Pop quizzes locked with passcode may be given anytime during class. They are usually explained in class and due on the end of the lecture day. The purpose of pop quizzes is to encourage you to study and review the concepts and materials we discussed in the lecture.

Midterm and Final Examinations:

There will be two midterm examinations, and a cumulative final exam.

- Exams may NOT be taken before or after the scheduled time for any reason. All the students need to attend synchronously.
- No make-up exams for anyone except for the medical emergency with the official medical proof.
- Use of electronic devices during exams is NOT allowed unless stated otherwise.
- All exams include quizzes (closed book) and written test (open book)
- All exams will remain with the instructor.

✔ Grading Information

Breakdown

Grading:

- Participation   (5%)
- Pop Quizzes   (15%)
- midterm exam 1   (20%),
- midterm exam 2   (20%),
- homework   (20%),
- final exam   (20%)

Criteria

The grading scale is as follows:

Grading Scale					
A+	97%	A	93%	A-	90%
B+	87%	B	83%	B-	80%
C+	77%	C	73%	C-	70%
D+	67%	D	63%	D-	60%
F	below 60.0%				

Final grades will not be adjusted in any way - so an 89.99% is still a B+. No incomplete grades will be given.

🏛 University Policies

Per [University Policy S16-9 (http://www.sjsu.edu/senate/docs/S16-9.pdf)](http://www.sjsu.edu/senate/docs/S16-9.pdf), relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on [Syllabus Information web page (https://www.sjsu.edu/curriculum/courses/syllabus-info.php)](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (https://www.sjsu.edu/curriculum/courses/syllabus-info.php). Make sure to visit this page to review and be aware of these university policies and resources.

📅 Course Schedule

Course Schedule (This schedule is subject to change. Any change will be communicated via Canvas with fair notice.)

Week	Date	Topic
1.	1/26	Introduction: Algorithms, Complexity vs Computability
2.	1/31,2/2	Stable Matching
3.	2/7, 2/9	Running time, Growth of functions- Graphs
4.	2/14, 2/16	Greedy technique
5.	2/21, 2/23	Divide and Conquer technique.
6.	2/28,3/2	Dynamic Programming technique
7.	3/7, 3/9	Network Flow, Midterm 1
8.	3/14, 3/16	Network Flow, Heaps
9.	3/21, 3/22	Universal Hashing, Amortized Analysis
10.	3/28,3/30	Spring Recess - no classes
11.	4/2-4/4	Intractability
12.	4/9, 4/11	Intractability, **Midterm 2**
13.	4/16, 4/18	Approximation Algorithms
14.	4/23, 4/25	Randomized Algorithms

15.	4/30, 12/1	Parallel/Distributed Algorithms	
16.	5/2, 5/4	Parallel/Distributed Algorithms,	
17.	5/9, 5/11	Review, Additional Topics	
18.	Final exam	9:45 AM-12:00 PM, Tuesday, May 23	9:45 AM-12:00 PM

SJSU ACADEMIC YEAR CALENDAR 2022/23