San José State University  
College of Science/Department of Computer Science  
CS 255, Design and Analysis of Algorithms, Section 1, Summer, 2023

Course and Contact Information

Instructor: Dr. Teng Moh  
Office Location: MQH 411  
Telephone: 408-924-5147  
Email: MyFirstName <dot> MyLastName <at> SJSU <dot> EDU  
Office Hours: MW 17:00 to 17:50  
Class Days/Time: MW 15:00 to 17:00  
Classroom: MQH 422  
Prerequisites: CS 155 or instructor consent.

Course Description

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

Course Format

This is an in-person course. All students registered for a College of Science (CoS) class with an in-person component must view the CoS COVID-19 Training (at https://drive.google.com/drive/folders/1Vmp39U9-CNpbwRobtZsGIZPTgRwV_Nh6) slides and the SJSU Phased Adapt Plan (at https://www.sjsu.edu/healthadvisories/sjsu-adapt/phases/index.php) website and acknowledge reading them according to their instructor's directions. By working together to follow these county and SJSU safety practices, we can keep our college safer. Students who do not follow COVID-19 Safety practice(s) outlined in the training, the SJSU Phased Adapt Plan, or instructions from their instructors, TAs or CoS Safety Staff may be dismissed from CoS buildings, facilities or field sites. Please review this training as needed throughout the semester, as updates will be implemented as changes occur (and posted to the same links).

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. Approximation
   c. Parallel

2. 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.

Required Texts/Readings

Textbook


Other Readings [Optional]


Other equipment / material requirement

- Wireless laptop

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 S16-9 at http://www.sjsu.edu/senate/docs/S16-9.pdf.

*Homework is due typewritten (include source code, but not executable files) by class starting time on the due date. Each assigned problem requires a solution and an explanation (or work) detailing how you arrived at your solution. Cite any outside sources used to solve a problem. When grading an assignment, I may ask for additional information. A subset of the assigned problems will typically be graded.*

Refer the course website for latest information of homework assignments.

NOTE that University policy F15-12 at http://www.sjsu.edu/senate/docs/F15-12.pdf states that “Students should attend all meetings of their classes, not only because they are responsible for material discussed therein, but because active participation is frequently essential to insure maximum benefit for all members of the class. Attendance per se shall not be used as a criterion for grading.”

Final Evaluation

One mid-term exam scheduled approximately at the end of 5th week, and a final exam scheduled on the Final week.
Grading Policy

**Grading information:**
- I will determine letter grades for the course, including +/- grades based on the following table:

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>92 and above</td>
<td>A</td>
</tr>
<tr>
<td>90 - 91</td>
<td>A-</td>
</tr>
<tr>
<td>88 - 89</td>
<td>B+</td>
</tr>
<tr>
<td>82 - 87</td>
<td>B</td>
</tr>
<tr>
<td>80 - 81</td>
<td>B-</td>
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<tr>
<td>78 - 79</td>
<td>C+</td>
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<tr>
<td>72 - 77</td>
<td>C</td>
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<tr>
<td>70 - 71</td>
<td>C-</td>
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<td>68 - 69</td>
<td>D+</td>
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<tr>
<td>62 - 67</td>
<td>D</td>
</tr>
<tr>
<td>60 - 61</td>
<td>D-</td>
</tr>
<tr>
<td>59 and below</td>
<td>F</td>
</tr>
</tbody>
</table>

- List of the percentage weight [or point value] assigned to various class assignments:
  - Homework: 20%
  - In-Person Midterm (Wednesday, July 5): 20%
  - Project: 30%
  - In-Person Final (Wednesday, August 9): 30%
- **NO** make-up exams will be given and **NO** late homework will be accepted.

Classroom Protocol

- **Always start your email subject with [CS255] to get my attention.**
- **Wireless laptop is required.** Your laptop must remain closed (preferably in your backpack and, in any case, not on your desk) until I inform you that it is needed for a particular activity.
- **Cheating** will not be tolerated, but working together is encouraged.
- **Student must be respectful of the instructor and other students.** For example, but not limited:
  - Turn off cell phones
- **To encourage participation from students, **NO** recording is allowed.**

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 information to all courses, such as academic integrity, accommodations, dropping and adding, consent for recording of class, etc. is available on Office of Graduate and Undergraduate Programs’ [Syllabus Information web page](http://www.sjsu.edu/gup/syllabusinfo/) at [http://www.sjsu.edu/gup/syllabusinfo/"]. Make sure to visit this page, review and be familiar with these university policies and resources.
# CS 255, Summer 2023, Course Schedule

The schedule is subject to change with fair notice and the notice will be made available in class.

## Course Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics, Readings, Assignments, Deadlines</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Topics in Algorithms and The Hiring Problem</td>
</tr>
<tr>
<td>2</td>
<td>Indicator Random Variables and Randomly Permuting Arrays</td>
</tr>
<tr>
<td>3</td>
<td>Balls and Bins and The On-line Hiring Problem</td>
</tr>
<tr>
<td>4</td>
<td>The Vertex-Cover Problem and 2-Approximation Algorithm</td>
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<tr>
<td>5</td>
<td>(2-ε)-Approximation Algorithm and The Traveling-Salesman Problem</td>
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<tr>
<td>6</td>
<td>The Set-Covering Problem and MAX-3-CFN Satisfiability</td>
</tr>
<tr>
<td>7</td>
<td>Weighted Vertex Cover and 3/2-Approximation Algorithm</td>
</tr>
<tr>
<td>8</td>
<td>Perfect Hashing and Cuckoo Hash</td>
</tr>
<tr>
<td>9</td>
<td>Static Threading and Multithreaded Algorithms</td>
</tr>
<tr>
<td>10</td>
<td>Applications of Randomized, Approximation, and Parallel Algorithms</td>
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</tbody>
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