# San José State University Department of Computer Science CS185C, Advanced Topics in Computer Science for Teachers, Section 4, Fall, 2024

## Course and Contact Information

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| Instructor: | Fabio Di Troia |
| Office Location: | MH217 |
| Telephone: |  |
| Email: | fabio.ditroia@sjsu.edu |
| Office Hours: | TBD |
| Class Days/Time: | TBD |
| Classroom: | TBD |
| Prerequisites: | EDTE 197 |
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## Course Format

This course follows a hybrid format, combining both in-person and online elements. The in-person lectures take place physically in the classroom. They offer direct interaction with the instructor and fellow students. The online lectures are conducted virtually, allowing you to participate from any location with an internet connection. The course schedule indicates which lectures are in-person and which are online.

## 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](http://sjsu.instructure.com) at <http://sjsu.instructure.com>. You are responsible for regularly checking with the messaging system through [MySJSU](http://my.sjsu.edu) at http://my.sjsu.edu (or other communication system as indicated by the instructor) to learn of any updates.

## Course Description

### The course is designed to equip students with a basic understanding of programming concepts, data structures, algorithms, and fundamental networking and security principles. The course is structured into four main modules, each focusing on a critical area of computer science (Object-Oriented Programming, Data Structures, Algorithms, Network and Security Fundamentals. Each module includes lectures, hands-on labs, and project work to ensure a comprehensive understanding of the topics covered. The course also includes a pedagogical component, providing strategies and techniques for effectively teaching and assessing these topics.

### Course Learning Outcomes (CLOs)

* Object-Oriented Programming: Understand and apply object-oriented design concepts such as encapsulation, polymorphism, inheritance, and abstraction using Python.
* Data Structure Proficiency: Implement and analyze various data structures including arrays, linked-lists, stacks, queues, trees, and graphs.
* Algorithmic Thinking: Develop efficient algorithms using techniques like brute force, recursion, searching, sorting, divide and conquer, and dynamic programming, along with understanding their time and space complexities.
* Networking and Security Fundamentals: Gain insights into the basics of networking, the importance of secure passwords, cryptography, and the identification and mitigation of malware threats.
* Pedagogical Skills: Develop effective teaching strategies for conveying complex computer science concepts.

## Required Texts/Readings

### Textbook

### TBD

### Other Readings

### TBD

### Other technology requirements / equipment / material

### None

## 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](http://www.sjsu.edu/senate/docs/S12-3.pdf) at <http://www.sjsu.edu/senate/docs/S12-3.pdf>.

Homework, Midterm and Final exam are expected for this class. Homework is due on Canvas 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.

NOTE that [University policy F69-24](http://www.sjsu.edu/senate/docs/F69-24.pdf) at <http://www.sjsu.edu/senate/docs/F69-24.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.”

**CoS COVID-19 Safety**

All students registered for a College of Science (CoS) class with an in-person component must view the [CoS COVID-19 Training](https://drive.google.com/drive/folders/1Vmp39U9-CNpbwRobtZsGIZPTgRwV_Nh6) slides and the [SJSU Phased Adapt Plan](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).

**Recording Classes**

This course or portions of this course (i.e., lectures, discussions, student presentations) will be recorded for instructional or educational purposes. The recordings will only be shared with students enrolled in the class through Canvas. The recordings will be deleted at the end of the semester. If, however, you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible accommodations (e.g., temporarily turning off identifying information from the Zoom session, including student name and picture, prior to recording). Students are not allowed to record without instructor permission. Students are prohibited from recording class activities (including class lectures, office hours, advising sessions, etc.), distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. This university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor.

### Final Examination or Evaluation

## The final test will be published on Canvas and will be submitted online.

## Grading Information

* Homework, 25%
* Midterm 1, 25%
* Midterm 2, 25%
* Final, 25%

### Note that "All students have the right, within a reasonable time, to know their academic scores, to review their grade-dependent work, and to be provided with explanations for the determination of their course grades." See [University Policy F13-1](http://www.sjsu.edu/senate/docs/F13-1.pdf) at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

### Determination of Grades

Semester grade will be computed as a weighted average of the scores obtained in each of the three categories listed above. No make-up tests or quizzes will be given and no late homework (or other work) will be accepted. Also, in-class work must be completed in the section that you are enrolled in.

Nominal Grading Scale:

|  |  |
| --- | --- |
| Percentage | Grade |
| 92 and above | A |
| 90 – 91 | A- |
| 88 – 89 | B+ |
| 82 – 87 | B |
| 80 – 81 | B- |
| 78 – 79 | C+ |
| 72 – 77 | C |
| 70 – 71 | C- |
| 68 – 69 | D+ |
| 62 – 67 | D |
| 60 - 61 | D- |
| 59 and below | F |

## Classroom Protocol

In this educational environment, we uphold a strict policy of integrity and respect. **Cheating** is absolutely unacceptable and will not be tolerated under any circumstances. It is expected by every student to be **respectful** towards both the instructor and their fellow students, fostering an atmosphere of mutual understanding and cooperation. To maintain focus and minimize disruptions, all **cell phones** must be turned off during class hours. Punctuality is key, so please ensure that you arrive as **class begins on time**. Lastly, for security and identification purposes, students are required to carry a **valid picture ID** at all times.

## 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](http://www.sjsu.edu/gup/syllabusinfo/) at http://www.sjsu.edu/gup/syllabusinfo/”. Make sure to review these policies and resources.

# CS185C / Advanced Topics in Computer Science for Teachers, Fall 2024, Course Schedule

*The schedule is subject to change with fair notice communicated via Canvas course page.*

## Course Schedule

| Week | Date | Topics, Readings, Assignments, Deadlines |
| --- | --- | --- |
| 1 |  | In-Person: Object-Oriented Design Concepts |
| 2 |  | Online: Encapsulation |
| 3 |  | In-Person: Polymorphism |
| 4 |  | In-Person: Inheritance |
| 5 |  | Online: Abstraction |
| 6 |  | **Midterm 1** |
| 7 |  | Online: Big-O Notation |
| 8 |  | In-Person: Sorting |
| 9 |  | In-Person: Linked Lists |
| 10 |  | Online: Stack and Queues |
| 11 |  | Online: Sets and Maps |
| 12 |  | **Midterm 2** |
| 13 |  | In-Person: Basic Crypto |
| 14 |  | In-Person: Networking Basics |
| 15 |  | Online: Malware |
| Final Exam |  |  |