

Object-Oriented Design Section 06

CS 151

Spring 2024 3 Unit(s) 01/24/2024 to 05/13/2024 Modified 01/28/2024

Contact Information

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Office: Online

Course materials such as handouts, notes, assignment instructions, etc. can be found on [Canvas Learning Management System](#) available at <https://sjsu.instructure.com>.

Students are responsible for regularly checking with its messaging system (or other communication system as indicated by the instructor) to learn of any updates.

Office Hours

TR 15:30 - 16:30

Online, by appointment

Please send me an email 24 hours before your requested office hour time.

The best way to ask questions is opening a Canvas discussion or asking via the course Discord.

Course Description and Requisites

Design of classes and interfaces. Object-oriented design methodologies and notations. Design patterns. Generics and reflection. Exception handling. Concurrent programming. Graphical user interface programming. Software engineering concepts and tools. Required team-based programming assignment.

Prerequisite(s): MATH 42, CS 46B, and [(CS 48 or CS 49J) if CS 46B was not in Java], each with a grade of "C-" or better; Allowed Declared Majors: Computer Science, Applied and Computational Math, Software Engineering, or Data Science; or instructor consent.

Letter Graded

Classroom Protocols

Consent for Recording of Class and Public Sharing of Instructor's Material

- Common courtesy and professional behavior dictate that you notify someone when you are recording him/her.
- You must obtain the instructor's written permission to make audio or video recordings in this class. Such permission allows the recordings to be used for your private study purposes only.
- The recordings are the intellectual property of the instructor.
- You have not been given any right to reproduce or distribute any material of this instructor unless you get written permission.

In-Person Class Protocol

- Please be on time!
- Cell phones should be in silent mode and should be kept in your pocket or backpack and should NOT be used during lectures.
- Laptops should remain closed until I inform you that it is needed for a particular activity unless it's being used for taking notes.
- Instant messaging, e-mailing, texting, tweeting, etc. are strictly forbidden in my class.
- Attendance is highly recommended, but is not mandatory, except for exam times.

Online Class Protocol

- All microphones will be muted automatically when you join the Zoom meeting. If you have any questions, you need to unmute it and speak up or type your question in the chat room.
- The chat room will be private, and the instructor reads your questions loudly and answers them.
- We won't use a camera during the lectures but will use it during the exams. Therefore, you need to get dressed appropriately. The dress code is "Business Casual".
- Attendance is highly recommended, but is not mandatory, except for exams.

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

If a student has been out of school for one or more days, he/she should report to his instructors upon his/her return to inquire about making up the work. Students who know in advance that they will miss one or more classes should inform their instructors about their plans."

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)

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

Object-Oriented Design

- Follow a systematic object-oriented design methodology.
- Develop use cases, perform noun/verb analysis, interpret, and produce CRC cards.
- Interpret and produce UML diagrams.
- Understand object-oriented concepts.
- Use design patterns.
- Practice SOLID design principles.

Advanced Java Language

- Implement Java fundamental concepts of OOP.
- Implement Java constructs such as: Interfaces, Abstract classes, Nested classes, ...
- Implement Java standard Object methods.
- Implement Java type system, lambda expression, serialization, Java generics, ...
- Implement exception handling.
- Implement threads and thread-safe data structures.

GUI Programming

- Use JavaFX to create graphical user interface (GUI) for **desktop applications**.

Course Materials

This course does not have a required textbook. My lecture notes contain all required materials.

Further Readings

1. Cay Horstmann, "Object-Oriented Design & Patterns," 3rd edition:
A watermarked edition will be provided in the Canvas.
The resources of this book can be found online at: <http://horstmann.com/oodp3/>
2. Stephen Gilbert and Bill McCarty, "Object-Oriented Design in Java," Sams
ISBN-13: 978-1571691347
3. The references at the end of each lecture note

Course Requirements and Assignments

Requirements

- **Java is the standard programming language for this course.** Having enough Java knowledge and skill is essential for understanding and passing this course.
- A computer with microphone and camera is required for online activities (some lectures, office hours, online exams, etc.).

Workload

- Success in this course is based on the expectation that students will spend at least 6 – 10 hours per week for:
 - Working on assignments.
 - Preparation for the exams (quizzes, midterms, and final).
 - Working on the term project.
- More details about student workload can be found in [University Policy S16-9](http://www.sjsu.edu/senate/docs/S16-9.pdf) available at <http://www.sjsu.edu/senate/docs/S16-9.pdf>.

✓ Grading Information

- To make the good habit of reviewing the materials **regularly**, there will be a weekly short quiz.
- There will be two midterms, and a final exam.
- To practice the covered materials in a real software **project**, there will be a term project and several individual assignments.
- All examinations would cover from the beginning of the semester.
- All examinations would be closed-all-materials.
- **There won't be any makeup for the exams.**
- To practice time management, late submissions will lose 20% of the total assignment score and an additional 20% for each 24-hour afterward.

Assignments	10%
Term Project	25%
Quizzes	20%
Midterm #1	10%
Midterm #2	15%
Final	20%
Total	100%

Nominal Grading Scale

From	To	Grade
97	100	A plus
93	96.99	A
90	92.99	A minus
87	89.99	B plus
83	86.99	B
80	82.99	B minus
77	79.99	C plus
73	76.99	C
70	72.99	C minus
67	69.99	D plus
63	66.99	D
60	62.99	D minus
0	59.99	F

University Policies

Per [University Policy S16-9 \(PDF\)](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 the [Syllabus Information](https://www.sjsu.edu/curriculum/courses/syllabus-info.php) (<https://www.sjsu.edu/curriculum/courses/syllabus-info.php>) web page. Make sure to visit this page to review and be aware of these university policies and resources.

Course Schedule

Note: This is a tentative schedule and is subject to change but with fair notice.

Day	Date	Lec #	Topics	Exams
1	01/24	0	Greensheet; A big picture of the course	
2	01/29	1	Enter OOP (Part 1)	
3	01/31	2	Enter OOP (Part 2)	Quiz 1
4	02/05	3	Software Development Lifecycle (Part 1)	
5	02/07	4	Software Development Lifecycle (Part 2)	Quiz 2
6	02/12	5	Software Development Lifecycle (Part 3)	
7	02/14	6	Software Development Lifecycle (Part 4)	Quiz 3
8	02/19	7	GUI Programming (Part 1)	
9	02/21	8	OOP Fundamentals (Part 1): Abstraction, Inheritance	Quiz 4
10	02/26		Review, Study Guide, Q & A	

Day	Date	Lec #	Topics	Exams
11	02/28		Exam: Mid 1	Quiz +
12	03/04	9	OOP Fundamentals (Part 2): Encapsulation, Interfaces	
13	03/06	10	OOP Fundamentals (Part 3): Polymorphism	Quiz 5
14	03/11	11	Java Constructs (Part 1); abstract class, nested class	
15	03/13	12	Java Constructs (Part 2); Anonymous class, Lambda expressions	Quiz 6
16	03/18	13	GUI Programming (Part 2)	
17	03/20	14	GUI Programming (Part 3)	Quiz 7
18	03/25	15	OOD Guidelines (Part 1): Design Patterns	
19	03/27	16	OOD Guidelines (Part 3): SOLID Principles	Quiz 8
20	04/01		Spring Break	
21	04/03		Spring Break	
22	04/08		Study Guide, Q & A	
23	04/10		Exam: Mid 2	Quiz ++
24	04/15	17	OOD Guidelines (Part 2): Design Patterns	
25	04/17	18	Implementation Guidelines (Part 1)	Quiz 9
26	04/22	19	OOD Guidelines (Part 4): SOLID Principles	

Day	Date	Lec #	Topics	Exams
27	04/24	20	Advanced Java (Part 1)	Quiz 10
28	04/29	21	Advanced Java (Part 2)	
29	05/01	22	Advanced Java (Part 3)	
30	05/06	23	Implementation Guidelines (Part 2)	
31	05/08		Study Guide, Q & A	

Final Exam

Date and Start Time	Mon, May 20 @ 12:15
Duration	Will be announced in Study Guide
Venue	In-Person or Online