

# Object-Oriented Design Section 08

## CS 151

Fall 2023 3 Unit(s) 08/21/2023 to 12/06/2023 Modified 08/20/2023

### Contact Information

#### Anant Shukla

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#### Office Hours

Tuesday, Thursday, 2:00 PM to 3:00 PM

Join the following Zoom link:

<https://sjsu.zoom.us/j/82628930080>

### 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 49J (or equivalent knowledge of Java) (with a grade of "C-" or better in each); Allowed Declared Majors: Computer Science, Applied and Computational Math, Software Engineering, or Data Science; or instructor consent.

Letter Graded

### \* Classroom Protocols

#### Communication

We will be using the Canvas discussion forums for class discussion. The system is catered to getting you help efficiently from fellow classmates and the instructor. Rather than emailing duplicated questions, students are encouraged to post questions on the Canvas discussion forums where the entire class can read and benefit from the responses. The instructor may re-post questions that are of general interest or discuss them in class.

While it is not a requirement, the best way to ask questions in the class / in office hours is as follows:

1. Explain what you are trying to accomplish.
2. Explain what your understanding of the problem is.
3. Explain what approaches you have already tried.
4. Explain what approaches you came across but didn't try, if any.
5. Show relevant work (code / writeup etc.).

This method of asking questions will get you much more helpful answers (from both the instructor as well as fellow students!)

### 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)

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

### 1. 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.

### 2. 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.

### 3. GUI Programming

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

## Course Materials

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There are no required books for this class. All the necessary material will be available on the class Canvas web page.

## Course Requirements and Assignments

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There will be 1 midterm and 1 final exam.

Several assignments or quizzes may be assigned periodically.

Java is the standard programming language for this course. Having enough Java knowledge and skill is essential for understanding and passing this course.

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.

## Grading Information

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### Extra-credits assignments

No extra-credit assignments are planned; However, the instructor may assign extra-credit assignments at his discretion with fair notice.

### Late Submission

Late submissions within 24 hours will have 10% of the final grade deducted. Submissions over 24 hours late will have 20% grade of the grade deducted. Late submissions over 2 days will not be accepted unless prior consent has been granted by the instructor or in documented cases of emergency.

## Criteria

Type	Weight	Topic	Notes
Assignments	25%		
Project	25%		
Midterm	25%		
Final	25%		

## Breakdown

Grade	Range	Notes
A+	95-100	
A	91 - 94	
A-	89-90	
B+	86-88	
B	82-85	
B-	80-81	
C+	77-79	
C	72-76	
C-	70-71	
D+	67-69	
D	63-66	
D-	60-62	
F	0-59	

## 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

Here's a breakdown of the course, lecture-by-lecture.

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

When	Topic	Notes
08/22	Introduction	
08/24	A class on Classes	
08/29	A class on Class Structure	
08/31	A class on Class Structure: Part 2	
09/05	But what is an Object?	
09/07	Adapting to our world	OOP Fundamentals
09/12	Oops!...I Did It Again	OOP Fundamentals
09/14	Oops!...I Did It Again (Part 2)	OOP Fundamentals
09/19	Project Discussions	
09/21	A trip to the room of requirements	SDLC: Part 1
09/26	Designing our world	SDLC: Part 2
09/28	Describing our world	SDLC Part 3
10/03	Creating our world	SDLC: Part 4
10/05	Life in Technicolor	GUI Programming
10/10	Midterm Review	
<b>MIDTERM</b> 10/12	Midterm	
10/17	Life in Technicolor II	GUI Programming
10/19	Using wheels (instead of reinventing them)	Design Patterns
10/17	Looking through the Kaleidoscope	Design Patterns
10/24	Doing others a SOLID	SOLID principles
10/26	Doing others a SOLID (Part 2)	SOLID principles
10/31	Being Exceptional	Exceptions, Handling, Defensive Programming
11/02	One Class to rule them all	Object Class
11/07	Making logical reasoning easier	Types
11/09	Working at ACME Corp	Generics
11/14	Serialization and other party tricks	
11/16	OOP in the real world	
11/21	OOP in the real world (Part 2)	
<b>HOLIDAY</b> 11/23	THANKSGIVING HOLIDAY	
11/28	Final Thoughts; The future of OOP	

When	Topic	Notes
11/30	Project Presentations	
12/05	Final Review	
FINAL 12/08/2023 2:45 PM - 5:00 PM	Final Exam	