College of Science · Computer Science

# Object Oriented Design CS 151

Spring 2026 - Section 05

## Contact Information


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| Instructor: | Robert Nicholson |
| Email: | robert.nicholson@sjsu.edu |
| Class Days/Time: | M/W 4:30 – 5:45 |
| Classroom: | Science (SCI) 164 |
| Office Hours: | Wednesday, 10:00am-12:00 PM<br>via Zoom: https://sjsu.zoom.us/j/8791841945<br>(other times by appointment) |


## 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.

**Grading:** Letter Graded

## Classroom Protocols

Students will be dropped from the class by the instructor (and will not be given ADD codes) for either one of the following reasons:

- absence for 1st day of class without informing you before 2nd day of class
- lack of prerequisites.

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.

Laptops that are capable of running the Lockdown Browser are required for all exams and quizzes and should be brough to each class. No other electronic devices are allowed during exams and quizzes.

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.

### Attendance

University policy F69-24 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.

I will not take attendance or grade on attendance. However, I will give periodic "pop quizzes" during class time. There will be no makeup for these quizzes unless you have a verifiable medical emergency.

Students should bring a laptop capable of running the Lockdown Browser to every class.

### Consent for Recording of Class and Public Sharing of Instructor Material:

University Policy S12-7, http://www.sjsu.edu/senate/docs/S12-7.pdf, requires students to obtain instructor's permission to record the course: Common courtesy and professional behavior dictate that you notify someone when you are recording him/her. You must obtain the instructor's 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 rights to reproduce or distribute the material. Course material cannot be shared publicly without his/her approval. You may not publicly share or upload instructor generated material for this course such as exam questions, lecture notes, or homework solutions without instructor's consent.

# 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 will be able to:

CLO 1: **Requirements gathering:** Gather the requirements for a software application, distinguish between functional and nonfunctional requirements, and express the requirements in the form of use cases.

CLO 2: **Object-oriented analysis:** Derive the appropriate classes from the requirements and define their responsibilities, behaviors, interrelationships, and internal structures. Draw UML use case, class, and sequence diagrams to document and communicate the analysis results.

CLO 3: **Object-oriented design:** Apply the results of analysis to implement the classes and interfaces. Incorporate concepts such as inheritance and polymorphism, programming by contract, coding to the interface, the open-closed principle, the Liskov substitution principle, and the Law of Demeter. Write code that is easily tested and use proven testing techniques.

CLO 4: **Design patterns:** Learn the major "Gang of Four" design patterns and recognize when it is appropriate to apply them.

CLO 5: **The Java object model:** Understand how Java implements the object model. Become aware of the hazards of Java.

CLO 6: **GUI programming:** Develop interactive programs that have a graphical user interface (GUI). Use callback routines with a software framework and comprehend inversion of control.

CLO 7: **Multi-threaded programming:** Learn the basics of programming multiple threads of control using semaphores, mutexes, and critical regions.

You will follow industry-standard best practices and use software development tools that are common in today's software industry.

You will develop the *critical job skill* of working in a small project team to successfully develop a software application that uses shared interfaces and data formats.

# Course Materials

There is no required text for this course.

**Recommended:**

Object-Oriented Software Design in C++
Ronald Mak
Manning, 2024

(Although this book uses C++, its coverage of design principles and patterns is outstanding. I will assign optional readings in this book.)

# Course Requirements and Assignments

**The course is delivered in person.**

All students are required to have access to a wireless laptop (running OSX, Windows, or some version of LINUX), with a camera and microphone, upon which you can install the required software.

The technology used will include Canvas, programming in Java, and an IDE (Integrated Development Environment)

# Course Requirements and Assignments

You should have good Java programming skills and be familiar with software development tools such as Eclipse or Visual Studio.

You will work during the semester in small teams. Programming assignments will provide practice with Object-Oriented Analysis and Design (OOAD) techniques and will include developing a game program that uses simple machine learning. Each assignment will include rubrics for its grading criteria.

Each team will also have a semester project to develop an application that it can demonstrate to the class. Each team will write a short report (10-15 pp.) that describes the design patterns and other OOAD techniques that it used, including a high-level architecture description with UML diagrams.

Each team will submit its assignments and project into Canvas, which will display the scoring rubrics for grading.

No late submission of assignments will be accepted except for the verified emergency such as doctor's notes or family death certificates.

**In general, all team members will receive the same score on each assignment. However, a small number of points may be awarded or deducted at the end of the semester based on feedback from your fellow team members.**

**If there are issues with team member conflicts or lack of contributions during the semester, contact the instructor as early as possible.**

## Midterm Exam

The Midterm will only be given during class time.

Makeup midterm exams will only be given in cases of verifiable emergency or illness.

The midterm exam date in this syllabus is approximate and subject to change.

### Final Exam

The final exam will be cumulative (it will cover the entire course).

Makeup exams are only given if there is a verifiable emergency or illness.

### Quizzes

There will be quizzes throughout the semester. The quizzes are designed to help students stay on top of the material and illustrate areas of confusion for both students and the instructor

### Technology

Students are required to have laptop computer, and to bring the computer to each class. The laptop must be capable of running the **Lockdown Browser**, which is used for quizzes and exams.

If you do not have access to a suitable laptop, SJSU has a free equipment loan program available. You will need a reliable WIFI connection to attend class.

If you run into issues with technology or WIFI, please reach out to the instructor.

## Grading Information

Final grades will not be adjusted in any way. No incomplete grades will be given. No late submission of assignments will be accepted except for the verified emergency such as doctor's notes or family death certificates.

### Breakdown

Assignments (25%)
Semester Project (30%)
Pop Quizzes (10%)
Midterm (15%)
Final (20%)

### Grade Criteria

Course grades will be based on a curve. Per CS Department policy, the median total score will earn a B–. Approximately one third of the class will earn higher grades, and another one third will earn lower grades.

## University Policies

Per University Policy 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) web page.

Make sure to visit this page to review and be aware of these university policies and resources.

# Key Dates

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| **Midterm** | Monday | 2/16/26 |
| **Final Project Due** | Wednesday | 5/6/26 |
| **Final Exam** | Monday | 5/18/26, 3:15-5:15 PM |