

San Jose State University
College of Science
Department of Computer Science
CS151, Object-Oriented Design, Sections 1,2 and 3, Spring 2017

Course and Contact Information

- Instructor: Dr. Kim
- Office Location: MacQuarrie Hall 217 (MH217)
- Telephone: 408-924-5122
- E-mail: suneuy.kim@sjsu.edu (Preferred mode of contact is via email.)
 - When you send me an e-mail to ask a question, use [Q] in a subject line to get a reply from me within a reasonable response time. Here is an example subject line to ask a question.

[Q] lecture note
- Office Hours: Tuesdays and Wednesdays 9:15 am - 10:15 am
- Class Days/Time/Classroom
 - Section 1 (Lecture): MW 10:30 am - 11:45 am MH 225
 - Section 2 (Lecture): MW 12:00 am - 13:15 am MH 225
 - Section 3 (Lecture): TR 12:00 am - 13:15 am MH 233
- Course Prerequisites: Math 42, CS46B, and CS 49J (or equivalent knowledge of Java) with a grade of C- or better in each or instructor consent.
- [Course Web Site](http://www.cs.sjsu.edu/~kim/cs151) at <http://www.cs.sjsu.edu/~kim/cs151>
Announcements and course materials will appear here. It is updated frequently. You are strongly encouraged to check out this course web page regularly.

Course Description

Design of classes and interfaces. Value and reference semantics. Object-oriented design methodologies and notations. Design patterns. Reflection and serialization. Exception handling. Graphical user interface programming. Frameworks and components. Multithreading.

Course Objectives

- OO Design:
 - Introduce core UML concepts
 - Introduce a simplified OO analysis and design methodology
 - Present the concept of design pattern
 - Present the concept of a software framework
- Java Language:
 - Make students proficient in the use and creation of interfaces and inheritance hierarchies
 - Make students proficient in the Java type system
 - Introduce threads and thread safety
- GUI Programming:
 - Introduce a GUI toolkit, including basic widgets and the event handling mechanism.

Course Learning Outcomes

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

- OO Design
 - Interpret and produce UML class diagrams and UML sequence diagrams
 - Develop simple use cases, perform noun-verb analysis, interpret and produce CRC cards
 - Appropriately select and apply the following design patterns in the construction of a software application: Composite, Decorator, Iterator, Strategy, Template method, and Observer
 - Be able to follow a systematic OO design methodology
- Java language
 - Create a class hierarchy involving existing and new interfaces and classes, including inner classes.
 - Design, implement, test, and debug programs in an object-oriented language, involving the creation of at least 10 classes and interfaces
 - Implement correctly the equals, hashCode, clone , toString methods
 - Use serializaton, reflection, and generics
 - Throw, propagate and catch exceptions
 - Implement threads and thread-safe data structures
- GUI Programming
 - Use a GUI toolkit to create a graphical user interface involving frames, buttons, text components, panels, menus, and simple geometric shapes

BS in Computer Science Program Outcomes Supported

These are the BSCS Program Outcomes supported by this course:

- An ability to apply knowledge of computing and mathematics to solve problems
- An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs
- An ability to function effectively on teams to accomplish a common goal
- An ability to use current techniques, skills, and tools necessary for computing practice
- An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices
- An ability to apply design and development principles in the construction of software systems of varying complexity

Course Topics

Chapter	Weeks
2. Object-Oriented Design Process	2
3. Guidelines for Class Design	1.5
4. Interface Types and Polymorphism	1.5

5. Patterns and GUI Programming	2
6. Inheritance and Abstract Classes	2
7. The Java Object Model	2
8. Frameworks	1
9. Multithreading	2
Total	14

Required Texts/Readings

- Textbook: Cay Horstmann, Object-Oriented Design and Patterns, 2nd ed., John Wiley & Sons, Inc., ISBN 0-471-74487-5
- Additional References
 - K. Arnold, J. Gosling and D.Holmes, The Java Programming Language, 4th Ed., Addison-Wesley.
 - M. Fowler, UML Distilled, 3rd Ed., Addison-Wesley.
 - E. Gamma et al., Design Patterns: Elements of Reusable Object-Oriented Software, Addison-Wesley.
 - X. Jia, Object-Oriented Software Development Using Java: Principles, Patterns, and Frameworks, 2nd Ed., Addison-Wesley.

Course Requirements and Assignments

- Programming Assignments and Project
 - Four **individual** programming assignments involving design and implementation.
 - A group project with 3 members per group in the last month of the semester involves OO design and GUI programming. A project description and guidelines will be posted later.
 - Unless I specifically ask for hard copies, all assignments will be submitted through my course web page. Find the homework submission link corresponding to your section at the left side of the course web page.
- Submission/Late Policy
 - Any assignments/project turned in past the deadline will get a penalty: For each late day, a 20% of the maximum obtainable score of the work will be taken out of what you earned. (a late day is one 24 hour period beyond the due date). For example, suppose the maximum score of an assignment is 100 and you earned 80 points. If the submission is late by two days, the final score of the assignment would be $80 - 2 * 20 = 40$.
 - Any submission turned in more than 48 hours past the deadline will result in a grade of zero for that assignment.
 - On-line submission: You can submit your work multiple times. If then, the latest one will be considered as the final submission. If the final submission is late, the late policy will be applied.
 - E-mail submissions will not be accepted for grading.
- Teamwork Policy
 - Once a team is formed, it will last through out the semester. If you dissolve your team, a significant amount of penalty will be determined by the instructor and given to both parties.
 - For the project, students are expected to report their own results as well as their

collaborators. The task responsibility and contribution of every team member must be precisely documented in a report. During the project demo, team members are expected to be able to provide correct answers to questions that are specific to their tasks. Team members will be graded individually based on the report, their participation in project demo and peer evaluation.

- Software
 - Programming Language: Java Platform SE 7 or higher
 - It is available on all Department machines.
 - [Download](http://www.oracle.com/technetwork/java/javase/downloads/index.html) at <http://www.oracle.com/technetwork/java/javase/downloads/index.html>
 - StarUML
 - [Download](http://staruml.sourceforge.net/en/download.phpa) at <http://staruml.sourceforge.net/en/download.phpa>
 - [StarUML Tutorial \(to start off\)](http://www.owlnet.rice.edu/~comp201/07-spring/info/staruml/) at <http://www.owlnet.rice.edu/~comp201/07-spring/info/staruml/>
 - [StarUML User Guide](http://staruml.sourceforge.net/en/documentations.php) at <http://staruml.sourceforge.net/en/documentations.php>
 - [Violet](http://horstmann.com/violet) at <http://horstmann.com/violet>
 - IDE:
 - [Eclipse](http://eclipse.org/) at <http://eclipse.org/>
 - [NetBeans](http://netbeans.org/) at <http://netbeans.org/>

Evaluation (Exams)

- There will be two midterm exams and one comprehensive final exam. The exams are scheduled as below. The dates of midterm exams are subject to change with fair notice, but the final exam date is firm and cannot be changed.
 - Midterm Exam I: Friday, March 10, Room: TBA, Time: 4:00 pm
 - Midterm Exam II: Friday, April 21, Room: TBA, Time: 4:00 pm
 - Final Exam:
 - Section 1 (MW 10:30 class): Friday, May 19 0945-1200
 - Section 2 (MW 12:00 class): Tuesday, May 23 0945-1200
 - Section 3 (TR 12:00 class): Wednesday, May 24 0945-1200
- Makeup Exam Policy Absolutely no make-up exams will be offered under any circumstances. For those who couldn't take the exam or worked hard but had a bad day on the exam day ending up with a low score, I offer the following opportunity to possibly replace your worst midterm score with the final score. If your final exam (percentage) grade is higher than your worst midterm (percentage) grade, then I will replace the worst midterm grade with your final exam grade. For example, if you have a 60% on your worst midterm and you receive an 80% on the final exam, I will replace the 60% by 80% in the computation of your course grade.

Grading Information

You will receive the final grade based on the weighted average score on your performance. The grading weights are as follows.

- Exam I: 20 %
- Exam II: 20 %
- Final Exam: 30 %
- Programming Assignments: 20 %
- Project: 10 %

I first try scores of 90, 80, and 70 to cut off letter grades of A-, B-, and C-, respectively. If overall class performance is too low to use these cut offs, I set a cut off of C- to a lower score than the class total average but a higher score than 60 (this number may change), and divide the students' group above the cut off of C- into A+, A, A-, B+, B, B-, C+, C, C-. The rest of students will be given by a grade of D+, D, D-, F or WU depending on their class performance.

Classroom Protocol

- 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. Attendance per se shall not be used as a criterion for grading.”
- Consent for Recording of Class and Public Sharing of Instructor Material : [University Policy S12-7](http://www.sjsu.edu/senate/docs/S12-7.pdf), <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 consent.”

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/>”

CS151 Object-Oriented Design, Spring 2017: Semester Schedule

Subject to change with fair notice.

Week	Topics	Assignments
1	CS151 Orientation	
1	Object-Oriented Design Process	
2	Object-Oriented Design Process	
2	Object-Oriented Design Process	
3	Object-Oriented Design Process	Assignment 1 is out
3	Guidelines for Class Design	
4	Guidelines for Class Design	
4	Interface Types and Polymorphism	
5	Interface Types and Polymorphism	Assignment 2 is out

5	Interface Types and Polymorphism	
6	Interface Types and Polymorphism	
6	Patterns and GUI Programming	
7	MIDTERM I	
7	Patterns and GUI Programming	
8	Patterns and GUI Programming	Assignment 3 is out
8	Patterns and GUI Programming	Team Project is out
9	Patterns and GUI Programming	
	Spring Recess	
	Spring Recess	
9	Inheritance and Abstract Classes	Assignment 4 is out
10	Inheritance and Abstract Classes	
10	Inheritance and Abstract Classes	
11	Inheritance and Abstract Classes	
11	The Java Object Model	
12	Midterm II	
12	The Java Object Model	
13	The Java Object Model	
13	Frameworks	
14	Frameworks	
14	Multithreading	
15	Multithreading	
15	Multithreading, LAST DAY OF INSTRUCTION	
Final Exam		