

San Jose State University
College of Science
Department of Computer Science
CS151, Object-Oriented Design, Sections 1 and 2, Spring 2016

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 MacQuarrie Hall 223 (MH223)
 - Section 2 (Lecture): MW 12:00 am - 13:15 am MacQuarrie Hall 223 (MH223)
- 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.

Catalog 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.

Student 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.

Credit Hours Compliance Policy

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>.

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.”

Programming Assignments and Project

Overview

- Four 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.
- All programs must follow the [Java language coding guidelines](#).
- 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.php) at <http://staruml.sourceforge.net/en/download.php>
 - [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/>

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: TBA
- Midterm Exam II: TBA
- Final Exam:
 - Section 1 (MW 10:30 class): Tuesday, May 24 0945-1200
 - Section 2 (MW 12:00 class): Thursday, May 19 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 Policy

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.

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.

University Policies

Dropping and Adding

Students are responsible for understanding the policies and procedures about add/drop, grade forgiveness, etc. Refer to the current semester's [Academic Calendars webpage](http://www.sjsu.edu/provost/services/academic_calendars/) at http://www.sjsu.edu/provost/services/academic_calendars/. The [Advising Hub](http://www.sjsu.edu/advising/) at <http://www.sjsu.edu/advising/>.

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 developed by the instructor is the intellectual property of the instructor and 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.

Academic Integrity

Students should know that the [University's Academic Integrity Policy](http://www.sa.sjsu.edu/download/judicial_affairs/Academic_Integrity_Policy_S07-2.pdf) is available at http://www.sa.sjsu.edu/download/judicial_affairs/Academic_Integrity_Policy_S07-2.pdf. Your own commitment to learning, as evidenced by your enrollment at San Jose State University and the University's integrity policy, require you to be honest in all your academic course work. Faculty members are required to report all infractions to the office of Student Conduct and Ethical Development. The website for [Student Conduct and Ethical Development](http://www.sa.sjsu.edu/judicial_affairs/index.html) is available at http://www.sa.sjsu.edu/judicial_affairs/index.html. Instances of academic dishonesty will not be tolerated. Cheating on exams or plagiarism (presenting the work of another as your own, or the use of another person's ideas without giving proper credit) will result in a failing grade and sanctions by the University. For this class, all assignments are to be completed by the individual student unless otherwise specified.

Campus Policy in Compliance with the American Disabilities Act

If you need course adaptations or accommodations because of a disability, or if you need to make special arrangements in case the building must be evacuated, please make an appointment with me as soon as possible, or see me during office hours. [Presidential Directive 97-03](http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf) at http://www.sjsu.edu/president/docs/directives/PD_1997-03.pdf requires that students with disabilities requesting accommodations must register with the [Accessible Education Center \(AEC\)](http://www.sjsu.edu/aec) at <http://www.sjsu.edu/aec> to establish a record of their disability.

Accommodation to Students' Religious Holidays

San José State University shall provide accommodation on any graded class work or activities for students wishing to observe religious holidays when such observances require students to be absent from class. It is the responsibility of the student to inform the instructor, in writing, about such holidays before the add deadline at the start of each semester. If such holidays occur before the add deadline, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. See [University Policy S14-7](http://www.sjsu.edu/senate/docs/S14-7.pdf) at <http://www.sjsu.edu/senate/docs/S14-7.pdf>.

CS151 Object-Oriented Design, Fall 2015: Semester Schedule

Subject to change with fair notice at least one class period in advance Students will be notified in class and/or via course web site should any changes occur

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Week	Dates	Topics	Assignments
1	2/1	Introduction to CS151	
1	2/3	Object-Oriented Design Process	
2	2/8	Object-Oriented Design Process	
2	2/10	Object-Oriented Design Process	Assignment 1 is out
3	2/15	Object-Oriented Design Process	
3	2/17	Guidelines for Class Design	
4	2/22	Interface Types and Polymorphism	
4	2/24	Interface Types and Polymorphism	
5	2/29	Interface Types and Polymorphism	Assignment 2 is out
5	3/2	Interface Types and Polymorphism	
6	3/7	Patterns and GUI Programming	
6	3/9	MIDTERM I	
7	3/14	Patterns and GUI Programming	
7	3/16	Patterns and GUI Programming	
8	3/21	Patterns and GUI Programming	Assignment 3 is out
8	3/23	Patterns and GUI Programming	Team Project is out
	3/28	Spring Recess	
	3/30	Spring Recess	
9	4/4	Inheritance and Abstract Classes	
9	4/6	Inheritance and Abstract Classes	
10	4/11	Inheritance and Abstract Classes	

10	4/13	Inheritance and Abstract Classes	
11	4/18	The Java Object Model	Assignment 4 is out
11	4/20	The Java Object Model	
12	4/25	MIDTERM II	
12	4/27	The Java Object Model	
13	5/2	The Java Object Model	
13	5/4	Frameworks	
14	5/9	Multithreading	
14	5/11	Multithreading	
15	5/16	Multithreading, LAST DAY OF INSTRUCTION	
Final Exam		Section 2 (MW 12:00 class): Thursday, May 19 0945-1200	
Final Exam		Section 1 (MW 10:30 class): Tuesday, May 24 0945-1200	