

**San José State University**  
**Department of Computer Science**  
**CS151, Section 04**

**Object Oriented Design**

**Spring 2018**

**Course and Contact Information**

<b>Instructor:</b>	Vidya Rangasayee
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<b>Office Hours:</b>	T/Th 12 - 1 PM. Additional hours by appointment only
<b>Class Days/Time:</b>	T/Th 10:30 - 11:45 PM
<b>Classroom:</b>	MH 233
<b>Prerequisites:</b>	MATH 42, CS 46B, and CS 49J (or equivalent knowledge of Java) (with a grade of "C-" or better in each)
<b>GE/SJSU Studies Category:</b>	

**Course Format : Technology Intensive, hybrid.**

**Faculty Web Page and MYSJSU Messaging:** We will use Canvas for all class related materials. Discussions will be facilitated via Piazza. Any general questions must be posted on Piazza for benefit of others. Any specific/personal questions (grade related or personal situations) must be communicated via email. DO NOT use Canvas for emailing me. I hardly check those messages.

## 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. Required team-based programming assignment. Prerequisite: MATH 42, CS 46B, and CS 49J (or equivalent knowledge of Java) (with a grade of "C-" or better in each); Computer Science, Applied and Computational Math or Software Engineering majors only; or instructor consent.

## Course Learning Outcomes (CLO):

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

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

## Student Learning Outcomes

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

1. OO Design
  - a. Interpret and produce UML class diagrams and UML sequence diagrams
  - b. Develop simple use cases, perform noun-verb analysis, interpret and produce CRC cards
  - c. Appropriately select and apply the following design patterns in the construction of a software application: Composite, Decorator, Iterator, Strategy, Template method, and Observer
  - d. Be able to follow a systematic OO design methodology
1. Java language
  - a. Create a class hierarchy involving existing and new interfaces and classes, including inner classes.
  - b. Design, implement, test, and debug programs in an object-oriented language, involving the creation of at least 10 classes and interfaces
  - c. Implement correctly the equals, hashCode, clone, toString methods
  - d. Use serialization, reflection, and generics
  - e. Throw, propagate and catch exceptions
  - f. Implement threads and thread-safe data structures

2. GUI Programming
  - a. Use a GUI toolkit to create a graphical user interface involving frames, buttons, text components, panels, menus, and simple geometric shapes

## Required Texts/Readings

### Textbook

#### **Object Oriented Design and Patterns**

Author: Cay Horstmann

A newer version of the book is currently under development. Resources can be found at <http://horstmann.com/oodp3/>

A pdf version of the book will be made available through Canvas.

### Other Readings

#### **Design Patterns in Java | Edition: 2**

Author: Steven John Metsker, William C. Wake

ISBN: 9780321333025

Publication Date: 04/21/2006

Publisher: Addison-Wesley.

#### **Effective Java (Java Series) | Edition: 2**

Author: Joshua Bloch

ISBN: 9780321356680

Publication Date: 05/18/2008

Publisher: Addison-Wesley

#### **Java Concurrency in Practice**

Author: Brian Goetz, Tim Peierls, Joshua Bloch

ISBN: 9780321349606

Publication Date: 05/23/2006

Publisher: Addison-Wesley

### Other technology requirements / equipment / material

Java 7 or higher. IDE - Eclipse or Netbeans. (This is the minimum required version though most of you may be using Java 8. Java 9 which is the latest release has newer features. We will discuss Java 8/9 as needed in class).

### Course Requirements and Assignments

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>.

- Each student is expected to be present, punctual, and prepared at every scheduled class and lab session. It is assumed that the students already have basic knowledge of digital Boolean logic and fundamentals of programming.

- Attendance is NOT optional though it does not form any part of your grade. Individual participation is also required. There will be no make-ups for missed midterm or assignments, unless any special arrangements is made with the instructor beforehand. The student is responsible for any material he/she may have missed.
- There will be 6-7 **homeworks** (some of which are team based), one **final project**, one **midterm** and **final exam**. All homework should be submitted through Canvas. **No scanned copy** of handwritten solution is allowed.

### Final Examination or Evaluation

There is an online Final Exam for this course. Please check the university Final Exam schedule for the exact date and time of the final exam (<http://info.sjsu.edu/static/catalog/final-exam-schedule-spring.html>).

### Grading Information (Required)

1. Homework carries **60%** towards final score.
2. Midterm carries **15%** towards final score.
3. Final carries **25%** towards final score.

Submission is allowed till 11:59 pm on due date. You will lose 20% of the score for every day that your submission is LATE.

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,

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 at <http://www.sjsu.edu/senate/docs/F13-1.pdf> for more details.

### IClicker

Throughout this semester I will be using iClicker to track attendance as well as for self-review questions.

Register with iclicker. Instructions on how to do that is provided at

<http://www.sjsu.edu/ecampus/docs/iClicker%20Account%20-%20Setup%20Guide%20-%20Student.pdf>.

Instructions on adding this class is at <http://www.sjsu.edu/ecampus/docs/iClicker%20-%20Add%20Your%20Course%20-%20Setup%20Guide%20-%20Student.pdf>

### Classroom Protocol (aka how to succeed in this class)

1. **Attend all sessions.** From past semesters, data shows that there is a positive correlation between attendance and your overall grade.
2. **Come to class on time.** Students entering the classroom late disrupt the lecture and / or the students already in class who may be engaged in lab or discussion.
3. If you miss a lecture you are still responsible for any material discussed or assignments given. A large portion of each class will be used for hands-on lab / discussion. All students are expected to participate in class activities. Students who are often absent will find themselves at a disadvantage during the tests.

4. No audio / video recording or photography in the classroom without prior permission of instructor. Instructor may provide review videos and/or flipped classroom.
  5. No personal discussion or cell phone activity during class time. Please set the cell phone on **silent/vibrate** mode.
  6. Email to be sent to the instructor's SJSU email ID ([vidya.rangasayee@sjsu.edu](mailto:vidya.rangasayee@sjsu.edu)) only. Please DO NOT use canvas for emailing. I check email periodically during the day but much less during weekends. Please do not expect quick turnaround time during weekends.
  7. Start on your homework early and stay on top of them. Some assignments take way more time than you expect. Don't let your initial impression fool you.
  8. Start forming study/project groups NOW. It makes it easier to work with the group for the final project. Your project partners are highly important to your success so choose them wisely.
  9. Be prepared to learn A LOT. Some of this may require you to self study certain topics. I will guide you through this journey but the onus of getting the best of this class lies on you.
  10. If you are stuck or don't understand something, ASK. Come to office hours. If office hours don't work for you email, ask on piazza., ask me right after class. I cannot help you if you don't ask for it
- Have fun learning.

### University Policies (Required)

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 at <http://www.sjsu.edu/gup/syllabusinfo/>

## CS 151 Object Oriented Design, Spring 2017, Course Schedule

*Tentative schedule. Subject to change with notice.*

Week	Date	Topics, Readings, Assignments, Deadlines	Additional Notes
1	1/24/2018	Intro to CS151	
2	1/30/2018	Intermediate Java, Collections	HW01 Assigned
2	2/1/2018	Collections, Unit Testing	
3	2/6/2018	Object Oriented Concepts - Encapsulation and Inheritance, Abstract Classes	
3	2/8/2018	Object Oriented Concepts - Polymorphism	HW01 Due
4	2/13/2018	Object Oriented Concepts - Polymorphism, Interfaces	HW02 Assigned
4	2/15/2018	Guidelines for Class Design	

5	2/20/2018	Guidelines for Class Design	
5	2/22/2018	GUI Programming	HW02 Due
6	2/27/2018	GUI Programming	HW03 Assigned
6	3/1/2018	GUI Programming	
7	3/6/2018	Design Patterns	
7	3/8/2018	Design Patterns	HW03 Due
8	3/13/2018	Design Patterns	HW04 Assigned
8	3/15/2018	Java Object Model and Frameworks	
9	3/20/2018	Midterm Review	Project Assigned
9	3/22/2018	Midterm	Online
10	3/28/2018	SPRING RECESS	
10	3/30/2018	SPRING BREAK	
11	4/3/2018	Serialization	HW04 Due HW05 Assigned
11	4/5/2018	Reflection	
12	4/10/2018	Reflection	
12	4/12/2018	MultiThreaded Programming	HW05 Due
13	4/17/2018	MultiThreaded Programming	HW06 Assigned
13	4/19/2018	MultiThreaded Programming	
14	4/24/2018	Network Programming	
14	4/26/2018	Network Programming	HW06 Due
15	5/1/2018	Web Programming	HW07 Assigned
15	5/3/2018	Web Programming	

16	5/8/2018	Project Demo	
16	5/10/2018	Review	HW07 Due
Final Exam	5/22/2018	FINAL EXAM	Online