

[Instructor](#) | [Announcements](#) | [Course Info](#) | [Class Material](#) | [Schedule](#) | [Project](#) | [Grade](#) | [General Policy](#) | [Related Links](#)

**CmpE 285**

# Software Engineering Processes

**Spring 2017**

## Instructor

Richard Sinn  
Email: richardsinn@yahoo.com  
Office Hours: Before class, by appointment or email only

Richard is currently a Senior Software Development Manager at Adobe. He manages teams in Creative Cloud Mobile Engineering. Before Adobe, he was a Principal MTS/Director at eBay looking over various security projects. Prior to that, he served as a Security Architect/Manager at various Yahoo business units (Real Time Communication group, Yahoo Community, Yahoo Communications) from 2005 to 2011. He has also held various senior positions at IBM, Oracle and different Silicon Valley startup companies. Richard is an inventor and has filed over 25 patents. He has published a college textbook (Software Security Technologies). He is also a frequent writer for various magazines and journals, and a frequent speaker at regional and national technology conferences. As a scholar and supporter for academia, he has been teaching in the Computer Engineering and Computer Science departments at San Jose State University since 1998. He also served as Adjunct Professor at the University of Minnesota.

## Prereq:

*Coreq: CMPE 202 or CMPE 220 or instructor consent.*

## New Prereq check procedure

At the beginning of the term, have all the students in the class provide a copy of their transcripts, with the prerequisite class grade highlighted. The instructor will then check off against the roster, and drop any and all students who do not provide such proof of having completed the prerequisite with a satisfactory grade.

For classes with co-requisite requirements (such as CMPE 110), the student will provide the transcript (proving that the class has already been passed) or a printout from MySJSU (proving that the student is currently enrolled).

Add the following to the class greensheet: "Students who do not provide documentation of having satisfied the class prerequisite and co-requisite requirements (if any) by the second class meeting will be dropped from the class."

## General:

Bring a computer to class. You will need that for lecture / lab assignment.

[Official Green Sheet](#)

## Class time:

Every Monday at 6:00pm

## Class room:

CL 303

## Course Information

### Objectives

Software system development with emerging software engineering processes and technologies; planned and agile development processes, processes of Service-Oriented Architecture; component-based, Web-based, mobile based, event programming, wireless, user interface, and database access technologies. Corequisite: CMPE 202 or CMPE 220 or instructor consent.

## Program Outcomes (PO)

	Description
<b>PO 1</b>	Be able to demonstrate an understanding of advanced knowledge of the practice of computer/software engineering, from vision to analysis, design, validation and deployment.
<b>PO 2</b>	Be able to tackle complex engineering problems and tasks, using contemporary engineering principles, methodologies and tools.
<b>PO 3</b>	Be able to demonstrate leadership and the ability to participate in teamwork in an environment with different disciplines of engineering, science and business.
<b>PO 4</b>	Be aware of ethical, economic and environmental implications of their work, as appropriate.
<b>PO 5</b>	Be able to advance successfully in the engineering profession, and sustain a process of life-long learning in engineer or other professional areas.
<b>PO 6</b>	Be able to communicate effectively, in both oral and written forms.

## Course Learning Objectives (CLO)

	Description
<b>CLO 1</b>	Understand the issues, processes, responsibilities and tasks in software engineering project management.
<b>CLO 2</b>	Understand the different organizational approaches to software engineering project management.
<b>CLO 3</b>	Understand techniques involved in the successful leadership of software development project teams.
<b>CLO 4</b>	Apply engineering discipline to software development management.
<b>CLO 5</b>	Function in a leadership role for software development teams.
<b>CLO 6</b>	Communicate effectively during a software development project.
<b>CLO 7</b>	Effectively gather and document project requirements.
<b>CLO 8</b>	Discern the most effective process to use for a given project.

<b>CLO 9</b>	Effectively estimate, schedule, and plan work for a project team.
<b>CLO 10</b>	Apply critical thinking to the solution of software development problems and to effectively communicate the results of that thinking.

## Course Learning Objectives Support Program Outcomes

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
<b>CLO 1</b>	X	X		X	X	
<b>CLO 2</b>	X	X		X	X	
<b>CLO 3</b>	X	X	X	X	X	X
<b>CLO 4</b>	X	X				X
<b>CLO 5</b>				X		X
<b>CLO 6</b>		X				X
<b>CLO 7</b>	X		X			
<b>CLO 8</b>	X	X		X	X	
<b>CLO 9</b>	X	X				X
<b>CLO 10</b>			X	X		X

### Classroom Protocol

Each student is required to engage in classroom activities, participate in project reviews and presentations, submit assignments and reports on time, *and* take exams and tests on time.

### Grading

Apart from big term project(s) and presentation, there are homework assignments, a mid-term exam and a final exam. Some exams might be take-home. The weightings for grading are:

- Term Project(s) 20%,
- Homework 15%,
- Midterm 15%,
- Final Exam 20%,
- Team Presentation 10%
- Lecture/Lab assignments 20%.

No Late Assignment Submission. Put everything in an envelop when submit any material.

(Weightings for grade might change according to the progress of the semester.)

## University Policies

### *Academic Integrity*

Your own commitment to learning, as evidenced by your enrollment at San José State University, and the University's Academic Integrity Policy requires 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 policy on academic integrity can be found at [http://sa.sjsu.edu/student\\_conduct](http://sa.sjsu.edu/student_conduct). 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. If you would like to include your assignment or any material you have submitted, or plan to submit for another class, please note that SJSU's Academic Policy S07-2 requires approval of instructors.

### ***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 requires that students with disabilities requesting accommodations must register with the [Disability Resource Center](http://www.drc.sjsu.edu/) (DRC) at <http://www.drc.sjsu.edu/> to establish a record of their disability.

## **Student Technology Resources**

Computer labs for student use are available in the Academic Success Center located on the 1st floor of Clark Hall and on the 2nd floor of the Student Union. Additional computer labs may be available in your department/college. Computers are also available in the Martin Luther King Library. A wide variety of audio-visual equipment is available for student checkout from Media Services located in IRC 112. These items include digital and VHS camcorders, VHS and Beta video players, 16 mm, slide, overhead, DVD, CD, and audiotape players, sound systems, wireless microphones, projection screens and monitors.

## **Learning Assistance Resource Center**

The Learning Assistance Resource Center (LARC) is located in Room 600 in the Student Services Center. It is designed to assist students in the development of their full academic potential and to motivate them to become self-directed learners. The center provides support services, such as skills assessment, individual or group tutorials, subject advising, learning assistance, summer academic preparation and basic skills development. The [LARC website](http://www.sjsu.edu/larc/) is located at <http://www.sjsu.edu/larc/>.

## **SJSU Writing Center**

The SJSU Writing Center is located in Room 126 in Clark Hall. It is staffed by professional instructors and upper-division or graduate-level writing specialists from each of the seven SJSU colleges. Our writing specialists have met a rigorous GPA requirement, and they are well trained to assist all students at all levels within all disciplines to become better writers. The [Writing Center website](http://www.sjsu.edu/writingcenter/about/staff/) is located at <http://www.sjsu.edu/writingcenter/about/staff/>.

## **Peer Mentor Center**

The Peer Mentor Center is located on the 1st floor of Clark Hall in the Academic Success Center. The Peer Mentor Center is staffed with Peer Mentors who excel in helping students manage university life, tackling problems that range from academic challenges to interpersonal struggles. On the road to graduation, Peer Mentors are navigators, offering "roadside assistance" to peers who feel a bit lost or simply need help mapping out the locations of campus resources. Peer Mentor services are free and available on a drop-in basis, no reservation required. The [Peer Mentor Center website](http://www.sjsu.edu/muse/peermentor/) is located at <http://www.sjsu.edu/muse/peermentor/>

## **Class Material**

Lecture Notes

Required Textbooks:



## Schedule

Software Engineering Overview

### Jan 30, 2017 - Mon

- Info ([SJSU Salary Survey](#))
- Ch1 [Software and Software Engineering](#)
- Roster and Prereq check

### Feb 6, 2017 - Mon

- [Software Engineering Introduction](#)
- Reading assignment:
  - Chapter 4: Process Models
  - Chapter 5: Agile Development

### Feb 7, 2017 - Tue

- Last day to Drop a Class without an Entry

### Feb 13, 2017 - Mon

- Ch4 [Process Models](#)
  - Ch5 [Agile Development](#)
  - [Lab: Process](#)
  - Homework 1: Individual Homework (The book is eighth edition)
    - Problem 4.3
    - Problem 4.6
    - Problem 5.10
    - Problem 5.11
- Homework due Wed by 11:59pm PST - email to coolprofsinn @ gmail.com

### Feb 14, 2017 - Tue

- Last day to add courses

### Feb 20, 2017 - Mon

- Presidents' Day - Holiday - No class

### Feb 27, 2017 - Mon

- Lab Discussion
- All homework should be coolprofsinn2 @ gmail.com. Please reforward your previous emails to coolprofsinn2
- Requirement
- Ch 7 [Principles that Guide Practice](#)
- Ch 8 [Understanding Requirements](#)
- Ch 9 [Requirements Modeling: Scenarios, Information, and Analysis Classes](#)

### Mar 6, 2017 - Mon

- Case Study
  - CRC comments
  - Design
  - Ch 12 [Design Concepts](#)

- [HW/Lab: Architecture Design Exercise](#)
- [In Class - Lab: CRC](#)

#### Admin

- Sign the [honestyPledge](#), scan and email back to coolprofsinn2 @ gmail.com
- Show proof of pre-req (such as signin to SJSU system or transcript). Also email back to coolprofsinn
- (Due end of Wed)

#### Mar 13, 2017 - Mon

##### Design II

- Lab discussion
- Ch 15 [User Interface Design](#)
- Ch 16 [Pattern-Based Design](#)
- Lab: [User Interface Design](#)
- [Programming: Python](#) (External Source)
- **Reading Assignment:**
  - **Chapter 15: User Interface Design**
  - **Chapter 16: Pattern-based Design**

#### Mar 20, 2017 - Mon

- Midterm
  - Close book, you just need to bring pencil. Paper will be provided.
  - All topics before this day including all reading assignments will be covered.

#### Mar 27, 2017 - Mon

- Spring break - No class

##### Quality Management

#### Apr 3, 2017 - Mon

- **Reading Assignment:**
  - **Chapter 19: Quality Concepts**
  - **Chapter 22: Software Testing Strategies**

Reading assignment materials will be in the exams.

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- QA / QE I
- Ch 19 [Quality Concepts](#)
- [Programming: Python](#) (External Source)

#### Apr 10, 2017 - Mon

- QE II
- Reading Assignment:
  - Chapter 10: Requirements Modeling Class-based Method

Extra Credit homework

- Redo the questions you did wrong on the mid-term. Resubmit it via email (both question and answer).

#### Apr 17, 2017 - Mon

- QE II
- Ch 22 [Software Testing Strategies](#)
- [Programming: Python](#) (External Source)
- [Homework 1: Python Stock Profit Calculator](#)

#### Apr 24, 2017 - Mon

- PgM:
  - Ch 31 [Project Management Concepts](#)

Reading:

- Chapter 20 - Review Techniques
  - Chapter 22 - Software Testing Strategies
  - Chapter 12: Design Concepts
- [Homework 2: Basic Python Networking](#)
- **Homework 1 Due**
- Lab: [Project Management Problem](#)

#### May 1, 2017 - Mon

Project Management

- QE:
  - Ch 20 [Review Techniques](#)
- Homework 3: Individual Homework (The book is eighth edition)
  - Problem 16.1
  - Problem 16.11
  - Problem 19.3
  - Problem 19.11
- Lab: **Youtube Tryout**
  - Make a computer screen video with audio voice from your team members (any topic will do)
  - Upload to youtube (choice the option to allow public to watch with the link)
  - Test the link to make sure all your team members can watch the video
  - Email the video to coolprofsinn email

#### May 8, 2017 - Mon

- Ch 32 [Process and Project Metrics](#)
- Lab: [Process and Metrics](#)
- Project Desc

- Ch 36 [Maintenance and Reengineering](#)
- Reading Assignment
  - Chapter 35 - Risk Management
  - Chapter 30 Product Metrics
  - Chapter 36 - Maintenance and Reengineering
  - Chapter 37 - Software Process Improvement

**May 15, 2017 - Mon**

- [Estimate for Software Projects](#)
- Ch 37 [Software Process Improvement](#)
- Final Review

**May 22, 2017 - Mon - Final Exam**

- **Final**
- [Term Project Due Instruction](#). (Final Project Due)
- Same room
- 6:00pm
- 1 hour
- Comprehensive, covering all topics.
- Check grade at my.sjsu around the end of year. Grade will be only given over there (no email).
- Close book. No Internet / phone access.

Overflow Reference:

- Lab: [Reengineering](#)

**Term Project**

**Title:**

Stock Portfolio Suggestion Engine

**Group member:**

Form a group of 3 to 4 people.

**Research needed:**

- Python must be used for this project. Group members need to research on any additional python API needed
- Group members need to research on basic investment methodology

**Description:**

Based on previous lab exercises, this project provides a stock portfolio suggestion engine for the user.



User will:

- Input dollar amount to invest in USD (Minimum is \$5000 USD)
- Pick one or two investment strategies:
  - Ethical Investing
  - Growth Investing
  - Index Investing
  - Quality Investing
  - Value Investing

The engine needs to assign stocks or ETFs for a selected investment strategy. E.g.

Index Investing strategy could map to the following ETFs:

- Vanguard Total Stock Market ETF (VTI)
- iShares Core MSCI Total Intl Stk (IXUS)
- iShares Core 10+ Year USD Bond (ILTB)

And

Ethical Investing strategy could map to these stocks:

- Apple (APPL)
- Adobe (ADBE)
- Nestle (NSRGY)

Each strategy must map to at least 3 different stocks/ETFs.

### **Output:**

The suggestion engine will output:

- Which stocks are selected based on inputted strategies.
- How the money are divided to buy the suggested stock.
- The current values (up to the sec via Internet) of the overall portfolio (including all the stocks / ETFs)
- A weekly trend of the portfolio value. In order words, keep 5 days history of the overall portfolio value.

### **Decision:**

Each group needs to decide on various different parts of the project such as:

- UI to use
- How stocks/ETFs are mapped to investing strategy
- How the money is divided among buying
- How to present the weekly history of the portfolio value
- How many extra feature should be implemented to improve the project.

### **Grade**

Please check mySJSU.

### **General Policy**

The university and departmental policies and deadlines for course drop will be applied. Makeup exams cannot be offered, except under exceptional conditions, such as documented serious illness/accident, etc., and only at the professor's discretion.

Each student is responsible for his/her individual assignment, and must not copy anyone else's work. Students who borrow solutions from others will find themselves unable to pass the course. The minimum penalty for every student involved in the duplication of individual assignments or exams will be receiving a zero score on the submitted work.

For group project, all the work has to be done by your OWN group. Do not try to download "free code" from the Internet and hand in as a project. WE WILL FIND OUT. Do not share your work with others. So DO YOUR OWN WORK and EARN your grade.

## Related Links

Reference Chapters:

- The Goals and Terminology of Software Engineering ([Chapter 1](#))
  - Introduction to Quality and Metrics in Software Engineering ([Chapter 2](#))
  - Software Process ([Chapter 3](#))
  - Agile Software Processes ([Chapter 4](#))
  - Quality in the Software Process ([Chapter 5](#))
  - Software Configuration Management ([Chapter 6](#))
  - Principles of Software Project Management I: Organization, Tools, and Risk Management ([Chapter 7](#))
  - Principles of Software Project Management II: Estimation, Scheduling, and Planning ([Chapter 8](#))
  - Quality and Metrics in Project Management ([Chapter 9](#))
  - Principles of Requirements Analysis ([Chapter 10](#))
  - Analyzing High-Level Requirements ([Chapter 11](#))
  - Analyzing Detailed Requirements ([Chapter 12](#))
  - Quality and Metrics in Requirements Analysis ([Chapter 13](#))
  - Online Chapter - Formal and Emerging Methods ([Chapter 14](#))
  - Principles of Software Design ([Chapter 15](#))
  - The Unified Modeling Language ([Chapter 16](#))
  - Software Design Patterns ([Chapter 17](#))
  - Software Architecture ([Chapter 18](#))
  - Detailed Design ([Chapter 19](#))
  - Design Quality and Metrics ([Chapter 20](#))
  - Online Chapter - Advanced and Emerging Methods in Software Design ([Chapter 21](#))
  - Principles of Implementation ([Chapter 22](#))
  - Quality and Metrics in Implementation ([Chapter 23](#))
  - Refactoring ([Chapter 24](#))
  - Introduction to Software Testing ([Chapter 25](#))
  - Software Maintenance ([Chapter 29](#))
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- Ch 7 [Requirements Modeling: Flow, Behavior, Patterns, and WebApps](#)
  - Team Dynamics and Communication / Planning and Scheduling
  - Ch 21 [Formal Modeling and Verification](#)
  - Ch 23 [Product Metrics](#)
  - Ch 31 [Emerging Trends in Software Engineering](#)
  - Ch 32 [Concluding Comments](#)
  - Ch 26 [Estimation for Software Projects](#)

Related Chapters:

- Ch 13 [Architectural Design](#)
- Ch xx [Software Configuration Management](#)
- Ch 21 [Software Quality Assurance](#)
- Ch 23 [Testing Conventional Applications](#)
- Ch 25 [Testing Web Applications](#)
- [Lab: Cookie App](#)

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