CALIFORNIA STATE UNIVERSITY, FULLERTON
DEPARTMENT OF COMPUTER SCIENCE

CPSC 362 – Foundations of Software Engineering
Spring 2024

Description & Objectives

The primary purpose of this project-oriented course is to provide you concepts, reference material, and hands-on experience with software engineering technology. Students will learn basic concepts, principles, methods, techniques, and practices of software engineering. All aspects of the software engineering fields will be covered briefly.

Course Purpose

This course will introduce the technical and non-technical tools that comprise Software Engineering. The course will include theoretical, practical, and recommended methods of software engineering used in various organizations and industries.

The purpose of the course is to provide you with the basic skills necessary to operate effectively in a software project of any size. You'll gain experiential learning via a group project that will be operated using practices, principles, and situations that are as close to industry situations as possible.

A secondary purpose of the course is to ensure that you have started a portfolio that demonstrates your capabilities.

Prerequisites

CPSC 131

Instructor

Professor Ishan Goel
Email: igoel@fullerton.edu
Discord: ishanx17
Office Zoom Link: https://fullerton.zoom.us/j/5710288290
Office Hours: TBA

Meeting Information

Room: CS 101
Time: Tu 8PM-9:50PM
Th 8PM-9:50PM

Important Dates

CSUF's Academic Calendar is posted online at «http://apps.fullerton.edu/AcademicCalendar/». The Academic Calendar contains all the campus closures and holidays you should be aware of.

CSUF's Admissions Calendar is posted online at «http://www.fullerton.edu/admissions/Resources/Calendars.asp». The Admissions Calendar contains all the major dates with respect to adding, dropping, and withdrawing from your classes.

Midterm:	TBA
Final:	14th May, 2024 7PM to 8:50 PM CS 101

Required

Software Engineering: A Practical Approach, by Pressman, 9th Edition
ISBN 978-1259872976
Roger S. Pressman, Bruce R. Maxim

Optional

Many popular technical books may be read online through the campus's subscription to Safari Books Online. From outside of the campus network, the campus library's WWW proxy will grant you access, « http://www.library.fullerton.edu/asp/ipcheck.aspx?url=http://proquest.safaribooksonline.com/?uicode=calstate ». The Safari Books Online service can be accessed directly from any computer on the campus network, « http://proquest.safaribooksonline.com/ ».

Development Tool Resources

Students interested in using Microsoft® development tools may request a Dreamspark account at « http://dsreqform.ecs.fullerton.edu/ ». A student may, at no monetary cost, download full featured versions of Microsoft Visual Studio.
Students interested in using Apple® development tools can freely download Xcode through the App Store application bundled with OS X. Students may download Xcode directly from « https://developer.apple.com/xcode/ ».
A Debian-based GNU/Linux OS virtual machine ready for students use and Debian-style installation scripts are posted online at « https://gamble.ecs.fullerton.edu/resources/ ».
A CentOS-based shell server is available through secure shell (ssh) and secure file transfer protocol (sftp). The hostname is ecs.fullerton.edu. If your email address is malcolm@csu.fullerton.edu, then your username is ACAD\malcolm. If you are using a command-line ssh client, then your command to connect to ecs.fullerton.edu will be `ssh 'ACAD\malcolm@ecs.fullerton.edu'`. Your password is the same password as your CSUF Portal password.
Please consider adopting a package management system for your personal computer to facilitate adding, updating and removing the various software development tools you may wish to use.

- Apple OS X

- MacPorts « http://www.macports.org/ »
- Fink « http://www.finkproject.org/ »
- Homebrew « http://brew.sh/ »

- Microsoft Windows
  - Chocolatey NuGet « https://chocolatey.org/ »
  - Cygwin « http://www.cygwin.com/ »
  - Npackd « https://npackd.appspot.com/ »
- GNU/Linux OS
  - dpkg « https://www.debian.org/doc/manuals/debian-faq/ch-pkgtools.en.html »
  - rpm « http://fedoranews.org/alex/tutorial/rpm/ »

Learning Goals

1. Students will be able to translate an informal description of a problem into a precise requirements statement.
2. Students will develop and describe specifications for a software system.
3. Students will determine whether a program correctly meets its requirements, either through direct observation or the use of testing tools.
4. Students will demonstrate knowledge of a formalized software engineering process (e.g. spiral, waterfall, agile).
5. Students will deliver a clear oral presentation with an appropriate tone.
6. Students will design software exhibiting design best practices, such as clarity, structured programming, separation of concerns, and/or design principles and patterns.
7. Students will produce clearly written and properly formatted documentation.
8. Students will participate in a significant software project.

G.E. Requirements

This class does not meet any CSU General Education requirements.

Course Outline

Please note that these dates are subject to change. For more details see the CPSC 362 Course Outline page.

1. The Nature of Software and Software Engineering (1, 2).
2. The Software Process (3, 4, 5).
3. Requirements Modeling (8, 9).
4. Object-Oriented Concepts, Class-Based Requirements Modeling, Introduction to UML (Appendix 2, 10, Appendix 1).
5. Human Aspects and Principles that Guide Practice and Modeling Behavior (6, 7, 11).
6. Design Concepts and Architectural Design(12, 13) **Demo 1**
7. Component-Level, Pattern Based Design (14, 16).
8. User Interface and WebApp and MobileApp Design (15 ,17, 18).
9. Quality Concepts in Software, Software Review Techniques, (19, 20, 21).
10. Software Testing Strategies and Testing Conventional Applications (22, 23).
11. Testing Object Oriented, Web, and Mobile Applications (24, 25, 26) **Demo 2**

12. Managing Software Projects - Project Management, Process and Project Metrics, and Estimation for Software Projects (31, 32, 33).
13. Project Scheduling, Risk Management, Software Process Improvement (34, 35, 37).
14. Demos and Presentations.
15. Review
16. Final Exam.

Grading

Plus and minus grading is used when determining final grades. Final grades are computed by first finding the average score in each category described in the table below on the right. The average score for each category is then used to compute the weighted average according to the weights in the second table below.

Grading Scale

Grade	Percentage		Grade	Percentage		Grade	Percentage
A+	97-100%		B	83-86%		C-	70-72%
A	93-97%		B-	80-82%		D	60-69%
A-	90-92%		C+	77-79%		F	below 59%
B+	87-89%		C	73-76%			

Category	% of Final Grade
Class Participation	10%
Homework	15%
Midterm	20%
Final Exam	25%
Group Project	30%

Computer Science majors must earn a grade of C or higher in this course to receive credit. Computer Science majors earning grades of C- or lower must repeat the course.
Keep all assignments and exams returned to you so that any discrepancies can be easily and fairly resolved.

Note: While I make every attempt to ensure accurate grading in near-real time for exams and as prompt as possible grading for lab/assignment work, Canvas is not the official gradebook. The CSUF Portal is the official gradebook. Make sure you understand the monitoring of your grade and correct calculation of your weighted grades based on the table below. My final grades will be based on the weights below for all work.

Assignments

Programming and written assignments will be discussed in class and posted to the course website in advance of their due dates. Each assignment description will include the assignment and grading rubric. Reading assignments are posted on the course outline. It is the responsibility of the student to stay up to date with the reading and to take the online quizzes for each chapter assigned.

Written assignments must be typeset and presented in a professional manner. Presentation, spelling and grammar can be worth up to 30% of an assignment's grade.
All programming assignments must be written in a pre-approved programming language, unless specified otherwise. Coding style must conform to professional norms. At a minimum, code must be commented, have descriptive names for identifiers, and contain a comment at the top of each file with pertinent information such as the student's name, email address, and assignment name. A plain text README.TXT must be included with each assignment submission summarizing and documenting the work submitted. For students unfamiliar with coding style, Google's style guides are an excellent starting point,
« https://github.com/google/styleguide », particularly their C++ style guide,
« https://google.github.io/styleguide/cppguide.html ».
At the start of the semester, the instructor will detail the platform and tools used to grade student assignments. It is the student's responsibility to ensure that the assignments execute to his or her satisfaction on the instructor's grading platform.
There are approximately:

- 1 group project
- 12 weeks of reading assignments

Exceptions are made on a case by case basis given enough time and evidence to weigh the merits of the application.

Late Assignments

Assignments turned in late will have the grade reduced 10% for each day after the assignment due date (up to 50%) unless approval for late work is given in advance. Late assignments and forms will be accepted up to one week after the original due date. After a week, the grade will be entered as 0. If an assignment cannot be accessed when I open it for grading, it will be marked late until I can open it (Google Docs – make sure all links are "Anyone who has this link")

Attendance Policy

This section of the class will not require mandatory attendance at either the lectures or the labs.
Note that labs have in-person exercises that are critical to your mastery of the concepts.
However -- this course will have a group project. Collaboration effectiveness (either online or in-person) will be a component of your grade via this project. This project will be performed and assessed over the semester so synchronous participation will be required. Teams are instructed to accommodate distancing requests by team members, exactly as would occur in industry.

Make Up Policy

Exams and quizzes cannot be taken after they have been given in class. Due to an act of nature, personal medical emergency, a family crisis, an act of terrorism, severe civil unrest, etc. students have 10 calendar days to petition the instructor to retake any exam/quiz or submit an assignment without late penalty.

Exceptions shall be made on a case by case basis, provided there is time to evaluate the merits of such an application.

Participation

In the context of this course, participation is defined as the following:

- Arriving to class prepared and on time.
- Taking notes.
- Actively listening to the lecture and asking questions when appropriate.
- Annotating code listings and handouts.
- Bringing any required materials to class.
- When needed/desired, seeking assistance to complete assignments.
- Barring an emergency, not leaving the class session early unless the instructor consents.
- Not distracting oneself or others with smartphones, games, online diversions, etc.

Important Policies and Useful Information

Times and Timezones

All listed times are Pacific Time Zone (Daylight Savings when appropriate). It is your responsibility to translate that to your local time zone as needed.
Assignments and projects are due at 11:59pm of the due date unless otherwise explicitly stated.

Course Communication

All course announcements and individual email are sent through the learning management system (LMS) Titanium/Canvas, which only uses CSUF email accounts. Therefore, you MUST check your CSUF email on a regular basis (several times a week) for the duration of the course. Since the copy from Canvas Inbox to email may take a day, you must also check your Canvas Inbox.
Canvas will have the most current versions of this document and supplemental material. Check to make sure you have the most recent version.

University Policies and Information

See http://fdc.fullerton.edu/teaching/syllabus.php for details and explanations of the following University policy areas:

- Students with Special Needs
- Academic Dishonesty Policy
- Emergency Preparedness
- Undergraduate Student Learning Goals
- Student Learning Outcomes by Degree Programs
- Library Support
- Final Exams Schedule

Loaner Equipment

CSUF does not want the lack of hardware to impact your success! The Student Genius Center (part of the IT department, at Pollak North) has several loaner options available to students.
http://www.fullerton.edu/it/students/equipment/

Support

- Student Technical support: (657) 278-8888
- StudentITHelpDesk@fullerton.edu
- http://www.fullerton.edu/it/students/helpdesk/index.php
- Chat with IT: http://my.fullerton.edu/ and Click Online IT Help Click on Live Chat
- Canvas Support Hotline: 855-302-7528
- Canvas Support Chat Student

Alternative Procedure for Submitting Work

Please note alternative procedures for submitting work, in the event of technical problems.
In case of technical difficulties with the learning management system (LMS) Titanium/Canvas, the instructor will communicate with students directly through CSUF email, and assignments can be sent through email, faxed or mailed to the Computer Science Department, Room CS-522. In the vanishingly small possibility that email doesn't work, students should call the department coordinator at 657-278-4999 for further direction.

Policy on Retention of Student Work

Student work submitted for this course shall be retained by the University or its academic employees for a reasonable time after the semester is completed.

Software for Students

Did you know you can get FREE and low-cost software for being an active CSUF student? Software downloads and request forms can be found on the CSUF Student Software website.

Netiquette Requirements

Each student is expected to conduct themselves in a professional manner during the class - taking full advantage of the learning opportunities available. This includes completing all online discussions and assignments, adhering to proper netiquette, and so on. Netiquette refers to a set of behaviors that are appropriate for online activity -especially with email and threaded discussions. The core rules of netiquette can be found at http://www.albion.com/netiquette/corerules.html. Please read through these netiquette rules to ensure that you are familiar with what will be the expected online behavior for this course.

The Learning Management System (LMS) Titanium/Canvas

As a registered student you are enrolled in the Learning Management System (LMS) Titanium/Canvas. You may access Titanium/Canvas for all your classes by clicking on your student portal, found on the CSUF website. There is a short video explaining Titanium access and student resource guides for Canvas. Problems? Contact the student help desk at (657) 278-8888 or email StudentITHelpDesk@fullerton.edu.

University Learning Center

The goal of the University Learning Center is to provide all CSUF students with academic support in an inviting and contemporary environment. The staff of the University Learning Center will assist students with their academic assignments, general study skills, and computer user needs. The ULC staff work with all students from diverse backgrounds in most undergraduate general education courses including those in science and math; humanities and social sciences; as well as other subjects. They offer one-to-one peer tutoring, online writing review, and many more services. More information can be found on the University Learning Center website.

Writing Center

The Writing Center offers online tutorials aimed at providing assistance for all written assignments and student writing concerns. The website is https://english.fullerton.edu/writing_center/.

Academic Dishonesty

Students are encouraged to assist one another and discuss the course materials with your peers. It is your responsibility to be aware of and follow the spirit of CSU Fullerton's academic honesty policy which can be found at «http://www.fullerton.edu/senate/publications_policies_resolutions/ups/UPS%20300/UPS%20300.021.pdf ». Academic dishonesty will not be tolerated. The University Catalog and the Class Schedule provide a detailed description of Academic Dishonesty under *University Regulations*.

By submitting work for evaluation, you acknowledge that you have adhered to the spirit of the university's academic honesty policy and that your submission is an original work by you unless otherwise directed to work in groups. Failure to follow the spirit of the academic honesty policy will result in a severely negative evaluation of the work in question and may result in involving the Department Chair and the Judicial Affairs office to seek a disciplinary remedy.

ADA Accommodations

Any student who, because of a disability, may require special arrangements in order to meet course requirements must register with the Office of Disability Support Services within the first week of classes. The Office of Disability Support Services 'website is «http://www.fullerton.edu/DSS/». They can be reached by phone at 657-278-3117 or TDD at 657-278-2786. Their email address is «dsservices@fullerton.edu». Their office is located in University Hall, room 101. The instructor may request verification of need from the Dean of Students Office. Students requesting accommodations shall inform their instructors during the first week of classes about any disability or special needs that may require specific arrangements/accommodations related to attending class sessions, completing course assignments, writing papers or quizzes, tests or examinations.

Emergency Procedures

For your own safety and the safety of others, each student is expected to read and under Classroom Emergency Preparedness Guide

Information provided by the University Police Emergency Management Coordinator

On the first day of every semester:

- Know the emergency exits and evacuation areas for every classroom.
- Devise "buddy systems" so that everyone is accounted for in an evacuation.
- Evaluate the challenges that you might face during an evacuation and speak with your instructor.
- Add the CSUF Emergency Information number – 877-278-1712 – to your cell phone to hear recorded information regarding campus conditions or closure.
- Personal Preparation website

Emergency Communication

Campus emergency communication is done via a voice message, text and/or an email. Go to your Portal to review your contact information. A guide to update your personal information

Evacuations – Drills or real

- You may not know if this is a drill or not, so take every call to evacuate seriously.
- Take your personal belongings and immediately leave the building.
- Know where the evacuation area is for every building. A map of all campus evacuation areas
- Re-enter buildings only when directed by Building Marshals or other campus authority.
- Leave the campus only if instructed.
  For this class, the closest 2 exits are: south end of building
  We will meet at: parking lot east of residence halls, towards 57
  Earthquake
  As soon as you feel shaking, DROP, COVER and HOLD ON: Immediately seek shelter (under a desk or table) cover your head and hold on. Evacuate if directed, or you feel it is safe to do so.
  Fire

Shelter in Place or Dangerous Situation

- If directed, or you feel it is best to do so, seek shelter in a room with a lock.
- Turn off the lights and silence all cell phones.
- Hide as best as possible until the all clear signal has been given by authorities.
- If possible, move away from the dangerous situation as fast as you can.
- If you cannot safely hide or escape, be prepared to take action to protect yourself.
- See some helpful videos on sheltering in place
  When you need help Immediately or to report a dangerous situation, CALL 911.
  University Police non-emergency line: (657) 278-2515
  For more information
  Ask your instructor, or go to Campus Preparedness website
- When you see smoke or fire, immediately evacuate the building.
- If not already activated, pull the fire alarm switch to alert others of the situation.
- Use a fire extinguisher only if you know how to use it and the fire is small.

Instructional Continuity

Due to an event such as an epidemic or a natural disaster that disrupts normal campus operations, students must monitor the course Titan site and their campus email address for any instructions and assignments that the instructor announces.

Laboratory Safety

Safety is no accident. Learning and following the appropriate safety practices and protocols is an integral part to all laboratory courses. Following the appropriate safety practices and protocols minimizes the chances of repetive stress injuries, mishandling hazardous materials, and injury to self and others.

1. Don't change the computer configuration. Do not add or remove the hardware or unplug the computers.
2. Don't touch the instructor's computer and other materials.
3. Don't change the projector's configuration.

«http://riskmanagement.fullerton.edu/laboratorysafety/».

Extra Credit

There are no opportunities for extra credit.

Recording & Transcription of Class Content

Recording class content is governed by UPS 330.230, «http://www.fullerton.edu/senate/publications_policies_resolutions/ups/UPS%20300/UPS%20330.230.pdf ». Each instructor must permit class content to be recorded or transcribed by students when mandated to do so by the Americans with Disabilities Act or by other federal or state laws. Any recording of class content is for private use and study and shall not be made publicly accessible without the written consent of the instructor and students in the class.

Course Rules & Classroom Management

Unless an agreement or accommodation is reached between the student and the instructor, these rules must be followed.

- Attendance at all regularly scheduled lecture and discussion section is encouraged.
- Do not eat during lecture.
- If it makes noise, silence it.
- Portable computer use is not allowed in lecture except for taking notes.
- The student is responsible to be aware of any course announcements including changes to due dates and requirements.
- Homework, programming assignments, etc. may not be submitted late.

- Third party work (code, artwork, etc.) may not be used in student work without prior instructor consent. Failure to gain and document instructor consent will be construed as willful academic dishonesty.
- When a third party's work is incorporated into student work after gaining instructor consent, failure to wholly document the work's origin, copyright and license will be construed as willful academic dishonesty.

Course Schedule:

Week	Date	Theme, Topics
1	1/23	Syllabus Discussion, Introduction
2	1/25	Process Models
3	1/30	Agility and Process
4	2/6	Recommended Process Model
5	2/13	Human Aspects of Software Engineering
6	2/20	Principles that Guide Practice
7	2/27	Understanding Requirements
8	3/5	Requirements Modeling – A Recommended Approach
9	3/12	Design Concepts
10	3/19	Midterm
11	3/26	Architectural Design
April 1 - 7 SPRING RECESS		NO CLASS
12	4/9	User Experience Design.
13	4/16	Design for Mobility.
14	4/23	Pattern-Based Design
15	4/30	Quality Concepts
16	5/7	Revision and doubts class before Final Exam