Location and Times
Classes on Tuesdays and Thursdays, 12:30-1:45 in Gould-Simpson 906

Description of Course
Software engineering is the art and science of developing reliable software systems that address customer needs, subject to resource, business, and societal constraints.

The course will emphasize sound engineering principles and proven practices, illustrated by real-world examples. The course includes a team project that is central to the learning experience.

The course may include guest lectures on topics related to the course content.

Course Prerequisites
The course prerequisites are CSC 335, CSC 345, CSC 352.

Proficiency with a programming language such as Java and experience with completing a medium sized programming project are strongly recommended for completion of this course.

Proficiency in English is required for writing the project proposal and reports. The homework and tests may include questions that require reading and writing of English text.

Instructor Information
• Name: Ravi Sethi
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• Office Hours: Mondays & Wednesdays 10:00-11:00, or by appointment
• Page: http://www.cs.arizona.edu/~rsethi/

Teaching Assistant Information
• Name: Jixian Li
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• Office Hours: Tuesdays & Thursdays 11:00-12:00, or by appointment (Subject to Change).

Course Format and Teaching Methods
The course includes lectures, in-class group activities, a team project, and team presentations.
For the project, students will form their own teams of 4, prepare a written team proposal, design and implement a system, reflect on their experience, and complete a comprehensive final written report. Software and documentation produced by students will be made available as is, under the MIT open source license [http://opensource.org/licenses/MIT](http://opensource.org/licenses/MIT).

Course Objectives and Expected Learning Outcomes

The learning outcomes for the course as follows:

- Describe the relative advantages and disadvantages of the different practices that are key components of several major software development process models; e.g., waterfall, iterative, agile, continuous delivery
- Describe the fundamental challenges of and common techniques used for working with customers and identifying requirements.
- Design a simple software system, and explain how architecture and design principles have been applied in its design.
- Conduct a peer review of the architecture of a software system.
- Distinguish between program validation and verification
- Describe techniques for designing significant test cases for regression, integration, and system testing
- Set up an improvement program by establishing goals and defining metrics for establishing progress towards the goals.
- Discuss common behaviors that contribute to the effective functioning of a team.

Absence and Class Participation Policy

The UA policy concerning Class Attendance, Participation, and Administrative Drops is available at: [http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop](http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop)

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable: [http://policy.arizona.edu/human-resources/religious-accommodation-policy](http://policy.arizona.edu/human-resources/religious-accommodation-policy).

Absences preapproved by the UA Dean of Students (or dean’s designee) will be honored. See [https://deanofstudents.arizona.edu/absences](https://deanofstudents.arizona.edu/absences)

Participating in the course and attending lectures and other course events are vital to the learning process. As such, attendance is required at all lectures and discussion section meetings. Students who miss class due to illness or emergency are required to bring documentation from their healthcare provider or other relevant professional third parties. Failure to submit third-party documentation will result in unexcused absences.

Course Communications

The class web page [http://www.cs.arizona.edu/classes/cs436/fall16](http://www.cs.arizona.edu/classes/cs436/fall16) has general information about the course, including a link to this syllabus.

Announcements, events, homework, project templates, notes, readings, and other materials related to the course will be posted to the course materials page [http://www.cs.arizona.edu/classes/cs436/fall16/materials.html](http://www.cs.arizona.edu/classes/cs436/fall16/materials.html) during the semester.
**PDF Submission Policy.** Individual homework assignments and team proposal and reports are to be submitted electronically as PDFs through the appropriate folder in D2L ([https://d2l.arizona.edu](https://d2l.arizona.edu)). The first violation of the PDF submission policy will result in a 10% reduction in the credit for that submission. The second and later violations will result in the submission being disregarded, resulting in zero credit for that submission.

**Required Texts or Readings**

*Students will be assigned readings that will be available on-line either through the University of Arizona Library or through the class course materials page.*

Edited versions of the slides from the lectures will be posted to the class course materials page before the next lecture.

All materials made available through the instructor or The University of Arizona remain the property of the copyright holders. They are provided for the use of students in this course for the duration of the course, except as noted.

**Required or Special Materials**

Students are responsible for providing their own software and hardware systems and services that they might need for their project. Check with the instructor if you need special access to the computing facilities provided by the Department of Computer Science or the University.

**Assignments, Reports, and Exams: Schedule/Due Dates**

**Exams:**

- 10/13/16  Midterm Exam, covering course material to date. (To be graded by 10/27.)
- 12/09/16  1:00-3:00. Final Exam, covering course material from the start of the semester. (To be graded as required by University policies for submitting grades.)

**Team Project Reports:**

- 9/08/16  Preliminary proposal for the semester-long team project
- 9/22/16  Updated project proposal due
- 10/06/16  Complete Iteration 1 (Viable System) and submit Status Report
- 10/27/16  Complete Iteration 2 (Feature Release) and submit Status Report
- 11/17/16  Complete Iteration 3 (Full Beta Release) and submit draft Final Project Report
- 12/01/16  Comprehensive Final Project Report due

**Homework Due Dates:**

Graded homework will be returned before the next homework due date.

- 9/01/16  Homework 1
- 9/08/16  Homework 2
- 9/15/16  Homework 3
- 9/29/16  Homework 4
Late Work Policy

*Work will not be accepted late* except in case of a documented emergency or illness. Students who miss a deadline due to illness or emergency are required to bring documentation from their healthcare provider or other relevant professional third party. Failure to submit third-party documentation will result in zero credit.

Grading Policy

University policy regarding grades and grading systems is available at [http://catalog.arizona.edu/policy/grades-and-grading-system](http://catalog.arizona.edu/policy/grades-and-grading-system).

The purpose of grading is to assess the level of mastery on the following scale from the ACM-IEEE 2013 Curriculum Guidelines for Undergraduate Degree Programs in Computer Science:

- "Familiarity: The student understands what a concept is or what it means."
- "Usage: The student is able to use or apply a concept in a concrete way. Using a concept may include, for example, appropriately using a specific concept in a program, using a particular proof technique, or performing a particular analysis."
- "Assessment: The student is able to consider a concept from multiple viewpoints and/or justify the selection of a particular approach to solve a problem."

The proportion of questions on exams will be as follows:

- Familiarity at least 25%
- Usage up to 40%
- Assessment up to 35%
- Extra Credit 10%

These proportions add up to more than 100%. Additional points over 100% on one exam may be applied on another exam. Extra credit on exams cannot be used to offset a gap on homework, the team project, or team reports.

The contributions toward the grade in this Course are as follows:

- Individual Homework 15%
- Team Project 20%
- Team Project: Proposal and Reports 20%
- Midterm Exam 20%
- Final Exam 20%
- Instructor Discretion 5%

Grade Distribution for this Course:
• A: 90+%
• B: 80-89%
• C: 70-79%
• D: 60-69%
• E: 0-59%

Requests for incomplete (I) and withdrawal (W) must be made in accordance with University policies which are available at [http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete](http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete) and [http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal](http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal), respectively.

Department of Computer Science Grading Policy:
1. Instructors will explicitly promise when every assignment and exam will be graded and returned to students. These promised dates will appear in the syllabus, associated with the corresponding due dates and exam dates.
2. Graded homework will be returned before the next homework is due.
3. Exams will be returned "promptly", as defined by the instructor (and as promised in the syllabus).
4. Grading delays beyond promised return-by dates will be announced as soon as possible with an explanation for the delay.

Scheduled Topics

This course is an introduction to the following topics in Software Engineering:
• What is Software Engineering
• Introduction to Software Development Processes
• Working with Customers
• Goals and Metrics
• Project Planning
• Design and Architecture
• Static Analysis and Code Reviews
• Testing
• Model Checking
• Project Management

The ordering of the topics is subject to change. Additional topics may be added if time permits.

Department of Computer Science Code of Conduct

The Department of Computer Science is committed to providing and maintaining a supportive educational environment for all. We strive to be welcoming and inclusive, respect privacy and confidentiality, behave respectfully and courteously, and practice intellectual honesty. Disruptive behaviors (such as physical or emotional harassment, dismissive attitudes, and abuse of department resources) will not be tolerated. The complete Code of Conduct is available on our department website. We expect that you will adhere to this code, as well as the UA Student Code of Conduct, while you are a member of this class.
Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).

Students are asked to refrain from disruptive conversations with people sitting around them during lectures. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

Classroom Use of Personal Devices

The use of personal electronics such as phones, laptops, iPads, and other such mobile devices is distracting to the other students and the instructor. Their use can degrade the learning environment. Therefore, students are not permitted to use these devices during the class period.

Threatening Behavior Policy

The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.

UA Nondiscrimination and Anti-harassment Policy

The University is committed to creating and maintaining an environment free of discrimination; see http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy

Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

Code of Academic Integrity

Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity.

All materials made available through the instructor or The University of Arizona remain the property of the copyright holders. They are provided for the use of students in this course for the duration of the course, except as noted.

Selling class notes and/or other course materials to other students or to a third party for resale is a violation of copyright laws and. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses.
Notification of Objectionable Materials (if applicable)

Although some course content may be deemed offensive by some students, such materials are deemed important for the learning process. Students are not excused from interacting with such materials, but they are certainly encouraged to express well formed opinions that express those objections and their reasons for them.

Accessibility and Accommodations

Our goal in this classroom is that the learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let the instructor know immediately so that we can discuss options. You are also welcome to contact the Disability Resource Center (520-621-3268) to establish reasonable accommodations. For additional information on the Disability Resource Center and reasonable accommodations, please visit http://drc.arizona.edu.

If you have reasonable accommodations, please plan to meet with the instructor by appointment or during office hours to discuss accommodations and how the course requirements and activities may impact your ability to fully participate.

Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Additional Resources for Students

UA Academic policies and procedures are available at http://catalog.arizona.edu/policies

Student Assistance and Advocacy information is available at http://deanofstudents.arizona.edu/student-assistance/students/student-assistance

Confidentiality of Student Records


Subject to Change Statement

Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.