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.

Class Page

• http://www.cs.arizona.edu/classes/cs436/spring16

Piazza Link

• http://piazza.com/arizona/spring2016/csc436

Location and Times

Classes on Mondays and Wednesdays, 1:00-2:15, in Gould-Simpson 906

• Wednesday, January 13. First class
• Monday, January 18. No class. Martin Luther King Jr. Day.
• Monday, March 14. No class. Spring Break.
• Wednesday, March 16. No class. Spring Break.
• Wednesday, May 4. Last Class.
• Final Exam schedule to be announced.

Instructor Information

• Name: Ravi Sethi
• Office: Gould-Simpson 720
• Phone: 520-621-0689
• E-mail: rsethi@email.arizona.edu
• Office Hours: Mondays & Wednesdays 10:00-11:00, or by appointment
• Page: http://www.cs.arizona.edu/~rsethi/

Teaching Assistant Information

• Name: Jixian Li
• Office: Gould-Simpson 934
• Phone: 520-903-4340
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 requirements elicitation.
- Design a simple software system, and explain how architecture and design principles have been applied in this design.
- Conduct a peer review of the architecture of a software system.
- Distinguish between program validation and verification
- Describe techniques for identifying significant test cases for integration, regression, 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.

Topics

This course is an introduction to the following topics in Software Engineering:

- Software Development Processes: Plan-Driven, Iterative, Agile
- Working with Customers
- Goals and Metrics
- Design and Architecture
- Architecture and Code Reviews
- Verification and Validation
- Quality: Code Quality, Customer Quality
- Project Management
- Additional Topics (as time permits)

The ordering of the topics is subject to change.

Course Format and Teaching Methods

The course includes lectures, a team project, and team presentations.

For the project, students will form their own teams of 4, work with customers, 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 provided as is, under the MIT open source license.
Required and Recommended Texts

Students will be assigned readings from articles that will be available on-line either through the University of Arizona Library or through the class web site.

Edited versions of the slides from the lectures will be posted to the class web site.

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

Beyond the computing facilities provided by the Department of Computer Science, students are responsible for providing their own software and hardware systems and services that they might need for their project.

Required/Recommended Knowledge

The course pre-requisites 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 comprehensive final report on the project. The homework and tests may include questions that require reading and writing of English text.

Grading Policy

University policy regarding grades and grading systems is available at: http://registrar.arizona.edu/gradepolicy

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 30%
• Usage 30%
• Assessment 40%
• Extra Credit 10%
This proportion adds 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 15%
- Team Project: Peer and Instructor Reviews 5%
- Midterm Exam 20%
- Final Exam 20%
- Class Participation, Attendance 5%

Grade Distribution for this Course:

- A: 90+%  
- B: 80-89%  
- C: 70-79%  
- D: 60-69%  
- E: 0-59%

Requests for incompletes (I) and withdrawal (W) must be made in accordance with university policies which are available at http://catalog.arizona.edu/2015-16/policies/grade.htm.

**Honors Credit**

Students wishing to contract this course for Honors Credit should email me to set up an appointment to discuss the terms of the contact and to sign the Honors Course Contract Request Form. The form is available at http://www.honors.arizona.edu/future-students/honors-credit-across-campus.

**Attendance Policy**

The UA’s policy concerning Class Attendance and Administrative Drops is available at: http://catalog.arizona.edu/2015-16/policies/classatten.htm

Participating in the course and attending lectures and other course events is 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.

The UA policy regarding absences on and accommodation of religious holidays is available at http://deanofstudents.arizona.edu/policies-and-codes/accommodation-religious-observance-and-practice

From https://deanofstudents.arizona.edu/faqs:
“A Dean’s Excuse provides excused absences for *university-sponsored events/activities for academic, non-academic, and recognized student organizations*. If a student must miss a class or classes for a university-sponsored event, the faculty or staff responsible for that event request a UA Official Activity Excused Absence Request Form from the Dean of Students Office.”

“The Dean of Students Office does not have oversight of academic departments or faculty members and does not grant individual excused absences. Each faculty member manages his or her classroom in the manner in which they see fit and are the only ones who may determine what constitutes an excused absence. Therefore, we are unable to excuse absences for students, grant extensions, require that professors allow students to make-up missed work, or ensure students may miss class and submit late work without penalty, etc.”

“The best thing to do is for you to communicate directly with your professor regarding your absence. Your professor is the only person who can excuse your absence, and determine if alternatives or make-up work is an option. Your professor may also request documentation of your situation. If your professor will not excuse your absence or grant make-up work the Dean of Students Office is not able to require them to do so.”

**Late Work Policy**

As a rule, work will not be accepted late except in case of documented emergency or illness. You may petition the professor in writing for an exception if you feel you have a compelling reason for turning work in late.

**Assignment/Testing Schedule/Due Dates**

Number of required exams and assignments with description

**Exams:**

- 3/09/16  Midterm Exam, covering course material to date
- TBD  Final Exam, covering course material from the start of the semester.

**Team Project Reports:**

- 2/03/16  Preliminary proposal for the semester-long team project
- 2/10/16  Updated project proposal due
- 2/29/16  Complete Iteration 1 (Minimal Viable System) and submit Status Report
- 3/30/16  Complete Iteration 2 ( Desired Functionality) and submit Status Report
- 4/20/16  Complete Iteration 3 (Full System) and submit draft Final Project Report
- 4/27/16  Comprehensive Final Project Report due

**Homework:**

Homework will be roughly weekly. There will be 10 homework assignments.

**Report and Assignment Format**

**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.

*Individual or team submissions must be substantially the work of the student(s) who submit the work. If permitted, the use of open source or third party materials in student submissions must be clearly identified and credited.*

**Code of Conduct**

The Arizona Board of Regents’ Student Code of Conduct, ABOR Policy 5-308, prohibits threats of physical harm to any member of the University community, including to one’s self - http://azregents.asu.edu/rrc/Policy%20Manual/5-308-Student%20Code%20of%20Conduct.pdf

The Department of Computer Science’s Code of Conduct requires the following of all students, teaching assistants, staff and faculty:

We, the students and professionals of the UA Department of Computer Science, are committed to providing and maintaining a supportive community and a thriving educational environment.

We strive to:

- Be Welcoming and Inclusive
- Honor Privacy and Confidentiality
- Continue to Improve Our Learning Environments
- Behave Respectfully and Courteously
- Demonstrate Intellectual Honesty

Thank you for your contributions in support of these goals. Disruptive behaviors such as physical or emotional harassment, dismissive attitudes, and misuse of department resources are contrary to this code. If you have questions, want to make us aware of a problem, or wish to see someone recognized for their positive actions, please email: depthead@cs.arizona.edu

Students who violate this code will be asked to cease and may possibly be reported to the Dean of Students.

To foster a positive learning environment, students may not text, chat, make phone calls, play games, read the newspaper, or surf the web during lecture and discussion. 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. Students who continue to disrupt the class will be asked to leave the lecture or discussion and may be reported to the Dean of Students.

**Classroom Electronics**

The use of personal electronics such as laptops, tablets, 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.

**Notification of Objectionable Materials (if applicable)**

Although 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

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

If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my 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.

Student 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 http://deanofstudents.arizona.edu/policies-and-codes/code-academic-integrity

- Students may not discuss individual homework with anybody other than the instructors and teaching assistants.
- Students may not share individual homework solutions with anybody.
- Students may post questions to Piazza, but should refrain from posting solutions or partial solutions.
- Students may not share test cases for individual homework with anybody.
- Students may share class notes with anybody.
- Students may not seek homework help from anybody other than the instructors, teaching assistants, or departmental tutors.

Sale or resale of class notes and/or other course materials to other students or to a third party is not permitted without the instructor’s express written consent. 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 email to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student email addresses. This conduct may also constitute copyright infringement.

Additional Resources for Students

UA Non-discrimination and Anti-harassment policy: http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy

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

CSC 436, Spring 2016
Confidentiality of Student Records
http://www.registrar.arizona.edu/ferpa/ferpa-compliance

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