CS-261 Software Development

Spring 2023

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Contents

> Do more than belong: participate. Do more than care: help. Do more than believe: practice. Do more than be fair: be kind. Do more than forgive: forget. Do more than dream: work.

> — William Arthur War

1 Course description

1.1 Course Objectives

This course will provide students with an understanding of modern professional software development practices, including processes, tools, and teamwork. The class will be structured as a simulated development team, with students taking on various roles as they would in a real-world development environment. Although the instructor will provide a framework for the class and guidance on general topics, students in this seminar course will be responsible for collectively determining specific topical choices (e.g., specific tools or development methodologies) through a process of investigation, presentation, discussion, and finally group vote.

As a development team, we will use a "content project" to focus our investigations into tools and practices. This project will be a programming task of modest size and complexity which we will undertake as a group-the tools and processes will then be instantiated (chosen, studied, used, critiqued, etc.) in the context of developing this content project. Basic tool and process concepts will be introduced in the beginning of the semester, but students will be responsible, individually and in small groups, for the investigation of alternatives and the specific choices to be used by the team.

Much of the work for the class will therefore occur outside the weekly class meetings, with students returning to make presentations and to participate in team meetings to guide further development and investigation. A particular emphasis will be placed on documenting this entire process, so that a running archive of residuals (code, documentation, meeting notes, etc.) is maintained by the group. This archive should be useful both as a showcase for employers and for later teachings of the course.

The class will adopt inquiry based learning, student centered learning, and experiential learning to help students to learn about popular software development methodology and apply them in developing projects of their interests.

1.2 Class and instructor information

The class will meet Monday, Wednesday and Friday 9:10-10:10 AM in room 202, Ford Hall. I expect you to be in class on time and stay through the whole class period unless there are unusual

circumstances, and I expect your active participation in class discussions and activities. Friday class is generally dedicated to group project development, group meeting and group presentations.

Instructor	Email	Office	Phone number
Haiyan Cheng	hcheng@willamette.edu	Room 207, Ford Hall	(503) 375-5339

My office hour is Monday and Wednesday 10:10-11:40 AM. If you need to meet with me outside the office hour, please send me an email with a subject line "CS-261".

1.3 Course website and textbook

I will use the Willamette WISE website for class related announcements, teaching resources, project submissions, *etc.* You are responsible for checking your emails daily for class related announcements. We will not use a textbook, instead, I will post lectures and reading material on WISE.

1.4 Learning outcomes

Upon successful completion of the course students should:

1. understand what software engineering is and why it is important;

2. understand the software process and process models;

3. know about the fundamental process activities of software requirements engineering, software development, testing and evolution;

4. understand the rational for agile software development method, and the difference between agile and plan-driven development;

5. understand the Scrum approach to agile project management;

6. understand the concepts of user and system requirements;

7. understand the most important activities in a general, object-oriented design process;

8. understand ethical and professional issues that are important for software engineering;

9. have improved technical presentation skill;

10. have improved proficiency in abstract thinking ;

11. have improved independent and collaborative problem solving skill;

1.5   Main topics

We will cover the following topics during the semester. Because of the focus on projects, the order of introduction of the various topics will not always follow the order of the list.

- An overview of software engineering

- Software engineering methods and processes

- Agile software development

- Version control: Git

- Requirements engineering

- Design and Implementation

- Software testing

- Software evoluiton

2   Course deliverables

2.1   Homework and semester projects

You will have reading and writing assignments related to the course content. All assignments need to be finished by the designated deadlines. Late submission will result in 5% grade penalties. Each team will also present a lecture from a pre-selected list of topics.

The semester project will be a 3-4 person team project. Each team will need to consult the professor and get approval for their project ideas with a project proposal. Students will need to document their software development process.

2.2   SSRD Presentation

Students are required to present the semester project (earlier version) at the SSRD event on April 19. Please follow the tentative deadline dates provided by the SSRD committee for the SSRD participation.

- 2/19: Working Title and Intent to Present. Everyone who would like to present needs to share their intent and submit a working title that we can use to build the provisional

program. This title can be changed over the next month while the Final Title with the Abstract is developed.

- 3/19: Final Title with Abstract. Students will submit an updated title and a description of what they intend to present. The expectation is that in many cases the work to be shared is not yet complete on March 13th, but that by this date students should be able to forecast a reasonable description of what they will present in another month. The community will receive the SSRD Schedule with Program Abstracts on March 19th.

- The committee will make every effort to have the schedule and abstracts online at https://willamette.edu/arts-sciences/additional-academic-opportunities/ssrd/ on April 5th.

- April 19: Present at SSRD

2.3   Grading policy

For class attendance and participation, I expect you to attend all classes, to come to class prepared and ready to contribute to class discussion and exercises.

The following table shows the weights of the deliverables in calculating the overall grade for the course. Four or more unexcused absences will result in one final letter grade penalty, for example, A will become A-.

Deliverable	Total Weight
Individual writing assignments	20%
Personal website and git site	15%
SSRD and class participation	15 %
Group contributed lecture	20%
Final Project (Deliverables due May 11)	30 %
Total	100%

3   Other useful resources on campus

3.1   Academic Integrity

Students of Willamette University are members of a community that values excellence and integrity in every aspect of life. As such, we expect all community members to live up to the highest standards of personal, ethical, and moral conduct. Students are expected not to engage in any type of academic or intellectually dishonest practice and encouraged to display honesty, trust, fairness, respect, and responsibility in all they do. Plagiarism and cheating are especially

offensive to the integrity of courses in which they occur and against the College community as a whole. These acts involve intellectual dishonesty, deception, and fraud, which inhibit the honest exchange of ideas. Plagiarism and cheating may be grounds for failure in the course and/or dismissal from the College. http://willamette.edu/cla/catalog/policies/plagiarism-cheating.php

3.2 Classroom Conduct

As an educational institution, the College of Arts & Sciences is committed to supporting the ideals and standards that help create a constructive and healthy learning community. That requires, among other things, encouraging positive classroom behaviors, discouraging disruptive classroom behaviors, and setting clear standards for both of those things. Constructive classroom behaviors are those that support learners and teachers in an environment that promotes trust, respect, and collaborative learning. Disruptive classroom behaviors are those that undermine or interfere with the abilities to learn and to teach. Clear examples of disruptive behaviors include, but are not limited to: interrupting others or persistently speaking out of turn; distracting the class from the subject matter or discussion at hand; making unauthorized recordings or photos of a class meeting or discussion (except as permitted as part of an Accessible Education Services-mandated accommodations); and in extreme cases, any physical threat, physical, psychological, sexual harassment, ridicule, or abusive act towards a student, staff member, or instructor in a classroom or related setting.

3.3 Commitment to Positive Sexual Ethics

Willamette is a community committed to fostering safe, productive learning environments, and we value ethical sexual behaviors and standards. Title IX and our school policy prohibit discrimination on the basis of sex, which regards sexual misconduct – including discrimination, harassment, domestic and dating violence, sexual assault, and stalking. We understand that sexual violence can undermine students' academic success, and we encourage affected students to talk to someone about their experiences and get the support they need. Please be aware that as a mandatory reporter I am required to report any instances you disclose to Willamette's Title IX Coordinator. If you would rather share information with a confidential employee who does not have this responsibility, please contact our confidential advocate at confidential-advocate@willamette.edu. Confidential support also can be found with SARAs and at the GRAC (503-851-4245); and at WUTalk - a 24-hour telephone crisis counseling support line (503-375-5353). If you are in immediate danger, please call campus safety at 503-370-6911.

3.4 DACA/Undocumented Student Advocate

Willamette is committed to supporting our DACA/Undocumented students in a variety of ways. This year, Olivia Muñoz is the contact person for all DACA/undocumented students can provide

those students with a number of external and internal resources that are available. Her contact information is: email:omunoz@willamette.edu, Office: 3rd Floor UC, Phone: 503-370-6447.

3.5   Diversity and Disability Statement

Willamette University values diversity and inclusion; we are committed to a climate of mutual respect and full participation. My goal is to create a learning environment that is usable, equitable, inclusive and welcoming. If there are aspects of the instruction or design of this course that result in barriers to your inclusion or accurate assessment or achievement, please notify me as soon as possible. Students with disabilities are also encouraged to contact the Accessible Education Services office in Smullin 155 at 503-370-6737 or Accessible-info@willamette.edu to discuss a range of options to removing barriers in the course, including accommodations.

3.6   Religious Practice

Willamette University recognizes the value of religious practice and strives to accommodate students' commitment to their religious traditions whenever possible. Please let me know within the first two weeks of the semester if a conflict between holy days or other religious practice and full participation in the course is anticipated. I will do my best to work with you to determine a reasonable accommodation.

3.7   SOAR Center Offerings: Food, Clothing, and School Materials

The Students Organizing for Access to Resources (SOAR) Center provides free, confidential, and equitable access to food, toiletries, professional clothing, textbooks and scholarly resources for all WU and WU-affiliated students. The SOAR Center is located on the Putnam University Center's third floor. The space houses the Bearcat Pantry, Clothing Share, and First-Generation Book Drive and is maintained by committed students and advisors.
Please check https://willamette.edu/student-life/soar/index.html for current hours of operation and email soar-center@willamette.edu for any questions or concerns.

3.8   Trans Inclusive Classroom Space

I will gladly honor your request to address you by your affirmed name or gender pronoun. Please advise me of this at any point in the semester so that I may make appropriate changes to my records. If I accidentally use an incorrect gender pronoun when addressing you, please feel free to let me know, in whatever manner makes you comfortable, what pronouns you use so that I can make every effort to correct that error.

3.9   Land Acknowledgement

We are gathered on the land of the Kalapuya, who today are represented by the Confederated Tribes of the Grand Ronde and the Confederated Tribes of the Siletz Indians, whose relationship with this land continues to this day. We offer gratitude for the land itself, for those who have stewarded it for generations, and for the opportunity to study, learn, work, and be in community on this land. We acknowledge that our University's history, like many others, is fundamentally tied to the first colonial developments in the Willamette Valley. Finally, we respectfully acknowledge and honor past, present, and future Indigenous students of Willamette.

3.10   Time Commitment

Willamette's Credit Hour Policy holds that for every hour of class time there is an expectation of 2-3 hours' work outside of class. Thus, for this class you should anticipate spending 6-9 hours outside of class engaged in course-related activities. Examples include reading course materials, working on weekly assignments, preparing for exams, and working on projects.

3.11   Intellectual Property & Privacy

Class materials and discussions including recorded lectures are for the sole purpose of educating the students enrolled in the course. The release of such information (including but not limited to directly sharing, screen capturing, or recording content) is strictly prohibited, unless the instructor states otherwise. Doing so without the permission of the instructor will be considered an Honor Code violation and may also be a violation of other state and federal laws, such as the Copyright Act.