SFWE 403/503: Software Project Management
Course Syllabus

Instructor: Sharon ONeal
Contact Information: sharononeal@arizona.edu
Phone: 520-822-4040 (cell)
Office: Engineering Room 255 or via Zoom
Office Hours: TBR ***(AZ time zone)***

Appointments can be made outside of normal office hours by contacting the instructor to schedule a time that is mutually convenient

Course Description

This course will teach software engineering students how to plan, track and communicate the status of large-scale software projects to a diverse group of stakeholders. Using modern traditional and Agile software development methodologies and tools, and emulating a realistic software development project, students will be immersed in the activities used by industry to develop, manage, and monitor the development of a software product throughout the semester. Students will learn why planning a software project is important, what constitutes a good plan, how to adapt to the unexpected and unknowns that are likely to occur throughout the project development, and how to track and share the status of the project with their team members, other teams, and the customers/business managers. They will also learn how to monitor and track cost expenditures and compare against allocated budgets. Along the way, students will learn the importance of identifying risks and how to develop mitigation plans to address those risks, learn the role that software quality plays in project management, and have the opportunity to develop/hone their leadership and team collaboration skills while being part of an Agile team.

Learning Format:

This course is architected to engage and demonstrate key concepts of the materials covered using collaborative learning strategies. Students will watch pre-recorded lecture materials that have interactive features integrated into the materials before coming to class. Tools such as Playposit, Trello and Perusall may be used to allow students to demonstrate their understanding of the materials as

they watch/read/learn/do. Throughout this course, students will form small teams to work on activities and projects that demonstrate the key principles covered in the lectures.

Course Objectives:

During this course, students will:

1) Compare and contrast different software project management approaches.
2) Describe and exercise both traditional and Agile software management processes and activities.
3) Develop a software project plan for their semester project.
4) Use Agile project planning tools to plan, monitor, measure and communicate status to others.
5) Conduct retrospectives from one Agile sprint to another to identify things that are working well on the team and things that could be changed to enhance the team performance.
6) Develop a software product that solves a real-world challenge or problem while working on an Agile team.
7) Identify risks that could impede their progress in their projects, while developing mitigation plans to address those risks.
8) Monitor and track expended/realized development costs compared to budget allocations.
9) Use techniques to adhere to quality standards / requirements to enhance the overall quality and reliability of a software product.
10) Present a summary of the project development and demonstrate the resulting semester project in a Project Demonstration / Management Review with relevant stakeholders and other classmates.

Expected Learning Outcomes:

Upon the completion of this course, students should be able to:

1) Develop a software development plan/schedule and track progress to that plan using traditional software project management techniques and metrics. *[ABET Student Outcomes 1 and 5]*

2) Estimate and track software tasking to be completed for projects in multiple Agile sprints, epics, and/or minimum viable product(s) (MVP). *[ABET Student Outcome 5]*

3) Develop/implement a software product in a team setting that meets the specified product requirements and development timeline established in the software development plan and schedule. *[ABET Student Outcomes 2 and 5]*

4) Identify project development risks and create mitigation plans to address identified risks that will enable successful completion of the software project schedule/plan. *[ABET Student Outcomes 5 and 6]*
5) Conduct a critical chain analysis for the semester project to identify potential schedule drivers and risks and associated mitigation plans. *[ABET Student Outcome 6]*

6) Describe and demonstrate the ethical and fiscal responsibilities associated with executing and monitoring a software project development plan. *[ABET Student Outcome 4]*

7) Conduct periodic retrospectives and project management reviews with peers and other project stakeholders as would be conducted in an industry setting. *[ABET Student Outcomes 3 and 5]*
8) *Graduate students only* – Collect and analyze Agile metrics (such as velocity, technical debt, etc) to monitor and predict overall team performance.
9) *Graduate students only* – Monitor and track expended costs to budgeted allocations made at the start of a project.
10) *Graduate students only* – Create dashboards with the metrics collected and analyzed to provide quicklook status of how the team is performing as each Agile sprint is completed.

Course Prerequisites:
Advanced standing is required. It is also recommended to have completed SIE 464 prior to taking this course.

Course Format and Teaching Methods:
This course is structured around weekly progress. It will include a combination of lectures, and team activities focused on experiential learning, in-class discussions, and web-based assessments. The expected weekly progress is outlined in the course schedule. At a minimum it is recommended that students keep up with coursework by following the outlined course schedule on D2L. Note the **DUE DATES** on course deliverables are all posted on D2L.

Course Communications:
Announcements and important reminders will be regularly posted on D2L. Log in frequently to check for new announcements, reminders, and information related to the course.

You are encouraged to reach out to your instructor frequently throughout the semester via in-person lectures, email, phone call, text, office hours, or schedule an in-person or Zoom meeting. Every attempt will be made to respond to any questions or concerns that you may have within 24 hours, if possible (often sooner).

Class Attendance / Participation Policy:
The UA's policy concerning Class Attendance, Participation, and Administrative Drops is available at:
http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop

Participating in this course is vital to the learning process. As such, timely participation in online discussions and/or any team collaboration assignments is absolutely required. Students are expected to attend/watch all lectures and access the course at least twice a week. At a minimum, it is recommended that students keep up with coursework by following the outlined course schedule and notifications that will be posted on D2L. Note: **DUE DATES** for course deliverables will be documented both in the course calendar located on the course D2L Homepage and in the Content section of D2L.

Absences or failure to participate in class may affect a student's final course grade. If you anticipate being absent, are unexpectedly absent, or are unable to participate in class online activities, please contact the instructor as soon as possible. To request a disability-related accommodation to this attendance policy, please contact the Disability Resource Center at (520) 621-3268 or drc-info@email.arizona.edu. If you are experiencing unexpected barriers to your success in your courses, the Dean of Students Office is a central support resource for all students and may be helpful. The Dean of Students Office is in the Robert L. Nugent Building, room 100, or call 520-621-7057.

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.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: https://deanofstudents.arizona.edu/absences

Textbooks:
There is one required textbook for this course:

Software Project Management

5th Edition
Authors: Bob Hughes and Mike Cottrell

The following additional book is ***strongly recommended, but optional*** *(an eBook version may be available online with our UA Library)*:

Agile Estimating and Planning
Author: Mike Cohn

Other Supplemental Readings / References: *Additional supplemental materials will be referenced and provided to students via D2L.*

Software Tools Utilized: A variety of tools will be used in this class as part of the Agile project planning and project implementation. These tools may include open-source Integrated Development Environments (for code development), open-source Agile planning and tracking tools such as Trello, and Microsoft Project.

Course Schedule:
The following table provides an outline for the topics and objectives that will be covered during each module for this course. Specific dates will be posted on D2L for any given semester.

Module / Week	Topic	Learning Outcomes
Module 1	**Introduction to Software Project Management**	• Define the scope and activities involved in managing a software project. • Explore common problems and challenges with managing large software projects. • Identify the roles and responsibilities of different project stakeholders. • Define typical success criteria for a software project. • Utilize techniques and tools to enable effective leadership and collaborative teamwork.
Module 2	**Traditional Software Project Planning and Estimation**	• Employ methods used to estimate resources required to execute a software project. • Investigate the typical activities involved

		in traditional software project planning. • Create a traditional software project and resource allocation plan for the semester project.
Module 3	**Agile Project Planning and Estimation**	• Describe Agile software development methodologies to develop a software product. • Use different Agile estimating techniques to determine / evaluate the effort required to complete an Agile software project. • Explore techniques used to track velocity and technical debt for Agile sprints over time.
Module 4	**Release and Iteration Planning**	• Develop a software release plan. • Prioritize features to be included in a given software release. • Plan iterations leading up to a software release for the semester project. • Estimate the team's velocity for a given iteration.
Module 5	**Monitoring and Control**	• Explore and develop metrics to track team velocity and progress to the software project plan. • Status team performance/progress from one Agile sprint to another. • Measure and track a team's velocity and technical debt from one sprint to another. • Assess the impact of task delays and plan slippage. • Develop mitigation plans for problems / issues that emerge during project execution.
Module 6	**Risk Assessment and Management**	• Conduct critical chain analysis. • Identify factors that put a project plan at

		risk of slippage. • Categorize and prioritize actions for risk elimination or containment. • Quantify the impacts and effects of risks on project schedules/plans.
Module 7	**Communicating Software Project Status**	• Monitor and communicate project status to team members. • Monitor and communicate project status to other project stakeholders. • Analyze project metrics and adjust plans before starting subsequent Agile iterations. • Articulate risk assessments and mitigation plans that could impact software project plans and execution.
Module 8	**Software Quality Assurance**	• Explain the importance of software quality to software developers and users. • Define attributes of good software quality. • Design methods of measuring and monitoring software quality. • Explore software quality standards to ensure the quality of software acquired from an outside supplier. • Develop systems using procedures that increase overall software quality.

D2L Course Management System:

This course uses the University of Arizona's D2L course management system. You are **required** to use D2L with this class and are encouraged to check our D2L class course space daily.

You are also encouraged to have D2L email forwarded to your primary University of Arizona email account. We will use D2L for course assignments, exams, content distribution, and important announcements. The University of Arizona's D2L system is available at: http://D2L.arizona.edu.

Course Assignments and Exams:

There will be regular homework assignments on the topics covered in class, with approximately 8 homework assignments and one semester project. There will also be module-based discussion board prompts that each student is required to participate in and will be graded for. There will be one midterm exam and a final exam. All exams will be given as an online, timed exam, administered by a proctor, that will be available during the regularly scheduled exam time. ***Note: the instructor will give students ample notice of the format, time, and any resulting stipulations about where and how the exams will be administered.***

Final Examination:

The date and time of the final exam or project, along with links to the Final Exam Regulations can be found at https://www.registrar.arizona.edu/courses/final-examination-regulations-and-information, and Final Exam Schedule, http://www.registrar.arizona.edu/schedules/finals.htm

The grading distribution for course assignments, class/team participation, semester project, and exams is as follows:

Homework Assignments:	*15%*
Class / Team Participation:	*10%*
Lecture Knowledge Checks:	*10%*
Midterm Exam:	*10%*
Semester Project (see total grade distribution below):	*40%*
Personal reflection(s) (project related) (~5%)	
Implementation / associated documentation (~15%)	
Project status reviews / presentation of results (~20%)	
NOTE: Graduate students will also be required to create/analyze Agile metrics and create metrics dashboard that can be used to communicate project status to all stakeholders. They will also be required to monitor and track cost expenditures and compare against budget allocations made at the start of a project.	
Comprehensive Final Exam:	*15%*
Total	***100%***

Rubrics will be posted on D2L for all homework and semester project assignments.

Grading Scale and Policies:

The following scale will be used to award the final grades:

Percentage	Letter Grade

90% – 100%	**A**
80% – 89%	**B**
70% – 79%	**C**
60% – 69%	**D**
<60%	**E**

Homework is due at the time that it is specified in the course schedule and/or D2L content pages. ***Late homework and projects will not be accepted without prior approval by the instructor and will receive 0 points.***

All students will be required to ***individually*** submit a *Team Evaluation* at the end of the semester for the team-oriented semester project. An individual student's final team project grade will be factored by the average score of all team members' inputs from these evaluations. Every team member is expected to contribute equally to the project. If there are team dynamics that are preventing a collaborative working environment, it is best to inform the instructor ahead of time so that adjustments can be made to facilitate effective teaming and communication amongst the team.

Course Time Zone:
All dates and times mentioned in this course represent Mountain Standard Time (Arizona), which is UTC-7 hours. Arizona does not observe Daylight Savings Time. You can use the following link to get the current local time in Tucson, Arizona: http://www.timeanddate.com/worldclock/city.html?n=393

Course Policies:
Make-up exams: A make-up exam may only be given under extraordinary circumstances. The student requesting a make-up exam should contact the instructor well in advance and provide *written* documentation for the reason that he/she will not be able to attend the regularly scheduled exam. It is up to the discretion of the instructor to accept the justification provided by the student.

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#I and http://catalog.arizona.edu/2015-16/policies/grade.htm#W respectively.

Dispute of Grade Policy:
You can dispute any grade that you receive within two weeks that the grade has been awarded.

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

Academic Policies and Institutional Resources:

Academic Policies and Procedures:
As a University of Arizona student, you are expected to become familiar with and abide by the university-wide policies and procedures. You can find complete, up-to-date information at: http://catalog.arizona.edu/policies

Academic Integrity:
This course has a **zero-tolerance policy** with respect to violations 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.

Academic Dishonesty occurs whenever any action or attempted action is pursued that creates an unfair academic advantage or disadvantage for student and/or any member or members of the academic community. All forms of academic dishonesty are subject to sanctions under the Code of Academic Integrity. Sanctions include written warning, reduction in grade for work involved, disciplinary probation, loss of credit for work involved, failing grade in the course, suspension, and/or expulsion. Various forms of academic dishonesty include, but are not limited to cheating, fabrication, facilitating academic dishonesty, and/or plagiarism. If you are unclear what constitutes plagiarism, please ask the instructor.

Academic Misconduct is defined as any behaviors not conforming to prevailing standards or rules within the academic community. All forms of academic misconduct are subject to sanctions under the Code of Conduct. Sanctions include restricted access to university property, administrative hold, warning, probation, suspension, and/or expulsion. Various forms of academic misconduct include, but are not limited to disruptive behavior, threatening behavior, and/or the theft or damage of University property. For more specific examples of academic dishonesty, academic misconduct, and how to avoid such behaviors, please visit the following website:
http://deanofstudents.arizona.edu/tipsforavoidingacademicdishonesty

The University Libraries have some excellent tips for avoiding plagiarism available at: http://www.library.arizona.edu/help/tutorials/plagiarism/index.html.

Selling class notes and/or other course materials to other students or to a third party for resale 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.

Classroom Behavior Policy:
To foster a positive learning environment, students and the instructor 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.).

Online Collaboration/Netiquette:
In this course, you will can communicate with the instructor and peers through a variety of tools such as discussion forums, Jamboard, email, and other forms of web conferencing. The following guidelines will enable everyone in the course to participate and collaborate in a productive, safe environment.

- Be professional, courteous, and respectful as you would in a physical classroom.
- Online communication lacks the nonverbal cues that provide much of the meaning and nuances in face- to-face conversations. Choose your words carefully, phrase your sentences clearly, and stay on topic.
- It is expected that students may disagree with the research presented or the opinions of their fellow classmates. To disagree is fine but to disparage others' views is unacceptable. All comments should be kept civil and thoughtful. Remember that this course abides by university policies regarding disruptive behavior: http://policy.arizona.edu/education-and-student-affairs/disruptive-behavior-instructional-setting
- Compose your messages and posts in a word processing tool and check your spelling and grammar before submitting your post / email.

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, 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.

Statement of copyrighted materials:
All lecture notes, lectures, study guides and other course materials disseminated by the instructor to the students, whether in class or online, are original materials and reflect intellectual property

of the instructor or author of those works (with the exception of other published reference materials – i.e., course textbooks). All readings, study guides, lecture notes and handouts are intended for individual use by students. You may not distribute or reproduce these materials for commercial purposes without the express written consent of the instructor. Students who sell or distribute these materials for any use other than their own are in violation of the University's Intellectual Property Policy (available at http://ogc.arizona.edu/node/16). Violations of the instructor's copyright may result in course sanctions and violate the Code of Academic Integrity.

Student Support:

The instructor is available to assist with **content-related** issues. You may, at any time, email the instructor. This course also provides an ***Ask the Instructor*** discussion forum within the D2L environment. You are encouraged to post content-related questions to this forum at any time, especially for things that will benefit all students. *(It is not recommended that you use this forum for individual questions that are specific to your work or performance in the class.)* This forum will be monitored on a regular basis and the instructor will respond in a timely fashion. It is common for other students to participate in answering questions posted in the ***Ask the Instructor*** forum. You should feel free to contribute to the solution if you can provide knowledge or guidance related to the question.

The following are guidelines for requesting support:

- **General Course Questions:** Use the ***Ask the Instructor*** discussion forum for questions regarding course materials or policy.
- **Personal Course Questions**: Email the instructor to discuss grades or personal concern.
- **D2L Support Questions**: Email D2L@email.arizona.edu mailto:support@eller.arizona.edu.

Accommodations for Students with Disabilities:

The goal for this class is to enable learning experiences that are 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 encouraged 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 the instructor by appointment to discuss accommodations and how course requirements and activities may impact your ability to fully participate.

Students needing special accommodations or special services should contact the Disability Resources Center, 1224 East Lowell Street, Tucson AZ 85721, (520)621-3268, FAX (520)621-9423, email: drc-info@email.arizona.edu, http://drc.arizona.edu/. You must register and request that the center or DRC send the instructor official notification of your needs as soon as possible.

Please contact the instructor to discuss accommodations and how this course's requirements may impact your ability to fully participate. The need for accommodations must be documented by the Disability Resources Center.

Library Support:
The University of Arizona Libraries provides the research tools you need at any time. For an abbreviated list of resources directly related to a specific course, select the **Library Tools** link (located in the Tools drop down on the left of the screen within the Course Navigation bar).

Course Grievance Policy:
In case of grievances with a course component or grading, students are encouraged to first try and resolve the issue with the instructors. If you feel the issue is not resolved satisfactorily, please send an email to misonline@eller.arizona.edu.

Course Surveys and Evaluations:
Near the end of each semester / session, students will receive an invitation via email to complete an online course survey associated with this course administered by the Office of Instruction and Assessment thru the UA Student Course Survey (SCS) tool.

Your feedback is very important to the instructor as shown in the diagram below:

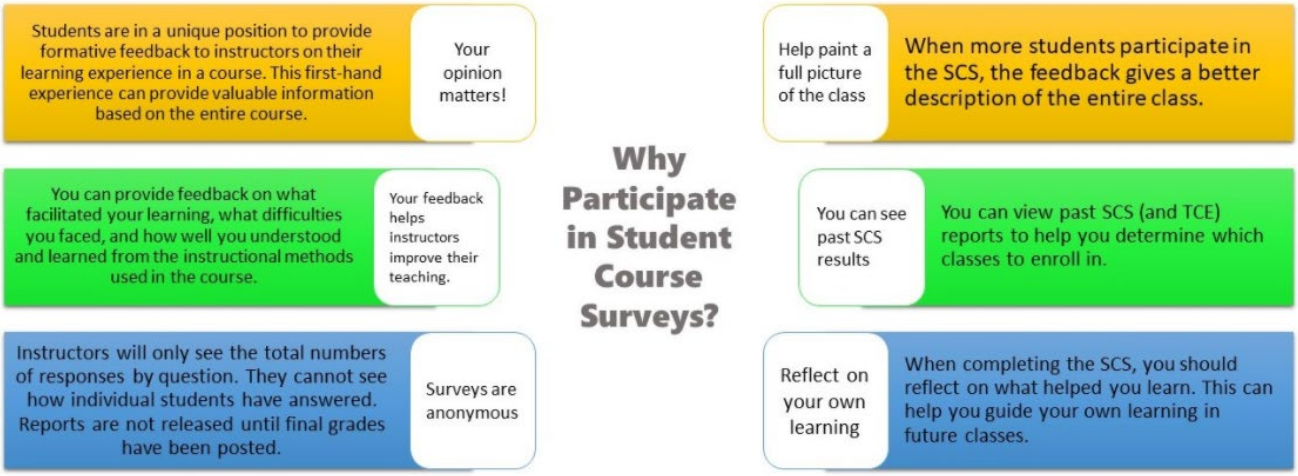

Diagram Source: whyscscropped.jpg (1280×491) (arizona.edu)

Your feedback is extremely valuable and will be used to make changes and enhancements to the course to better meet student needs in the future.

Additional Resources for Students (recommended links):

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

- **Confidentiality of Student Records:** http://www.registrar.arizona.edu/ferpa/default.htm

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.