SFWE 403/503: Software Project Management
COURSE SYLLABUS

Course Description

This course will teach you 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, you will be immersed in the activities used by industry to develop, manage, and monitor the development of a software product throughout the semester. You 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 your team members, other teams, and the customers/business managers. You will also learn how to monitor and track cost expenditures and compare against allocated budgets. Along the way, you 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 your leadership and team collaboration skills while being part of an Agile team.

Instructor and Contact Information

Instructor Name: Sharon ONeal
Email: sharononeal@arizona.edu
Cell Phone: (520)822-4040
Office: Virtual office - Zoom with advanced notice OR agreed to location in Old Engineering
Office Hours: Friday 10am – 12:30pm (AZ time zone) or via Zoom

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

You are encouraged to reach out to your instructor frequently throughout the semester via email, phone, text, office hours, or a scheduled synchronous meeting (in-person or Zoom). Every attempt will be made to respond to questions and concerns that you may have within 24 hours.

Course Prerequisites

Prior to enrolling in the course, **undergraduate students** are *required* to have:

- Advanced standing and SFWE 301
- It is recommended *(but not strictly enforced*) to have completed SFWE 302 prior to taking this course.

Course Format and Teaching Methods

This course is simultaneously offered in three modalities – fully online, in-person, and live online – offering opportunities for students to collaborate across modalities. Regardless of your learning modality, this course is structured around weekly progress as outlined in the course schedule. This course will include a combination of lectures, team activities, experiential learning opportunities, whole-class discussions, and web-based assessments. The course is designed to engage and demonstrate key concepts of the materials covered using collaborative and active learning strategies.

Course Objectives

During this course, you 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 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 completion of this course, you 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]

Additionally, **graduate students** should be able to:

1. Collect and analyze Agile metrics (such as velocity, technical debt, etc.) to monitor and predict overall team performance.

2. Monitor and track expended costs to budgeted allocations made at the start of a project.
3. Create dashboards with the metrics collected and analyzed to provide quick-look status of how the team is performing as each Agile sprint is completed.

Textbooks & Software

Required Textbooks

Software Project Management (5th Ed)
by Bob Hughes and Mike Cotterell
ISBN: 9780077169541

Available electronically through Inclusive Access

Required Software

You will need to download and install the following *free* software – links and instructions are available in the Start Here module of the D2L course site.

- **Integrated Development Environment (IDE)**
  You will need an IDE of your choice for code development.
- **Jira**
- **Microsoft Project** *(recommended, but not required)*

Recommended Textbooks

Agile Estimation and Planning
by Mike Cohn
ISBN: 9780137126347

Available electronically through the University Libraries

Assignments and Examinations

Individual Homework

There will be regular homework assignments on the topics covered in class, with approximately a total of 6 homework assignments. These assignments are to be completed on an individual basis (not a team basis).

Knowledge Checks

There will be online, essay-based knowledge check questions with the completion of each module. There will be approximately 8 knowledge checks that will be factored into your grade. Knowledge checks are an individual assessment of your understanding of the concepts and knowledge covered in a given module.

Comprehensive Exam

There will be one comprehensive exam. The exam 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 comprehensive exam will be administered.***

Semester Project

Team Component - The semester project is a team-based project. Teams will be formed consisting of 5-6 students. Each team will be given a high-level software product description and a list of system level requirements. Using Agile Scrum methodologies, the team will be required to develop the software product, in a

language of their choosing, that meets the given requirements. Students are required to use a commercially available Agile project collaboration tool, collect metrics, and complete various Scrum ceremonies throughout the software development over the course of the semester. The project will culminate in a comprehensive Software Status Review and Demonstration with project stakeholders and the rest of the students in the course.

Individual Components - In addition to the team portions of the project, you will be required to write a 2-page individual reflection of your experience working on the team, developing the requirements and test plan for the product the team was given, and also any lessons learned that you personally had working on the project.

Team Participation (part of the Individual Components) - Over the course of working on the semester team project, you will be required to individually submit 2 team evaluations for all deliverables for the semester project. 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.
Your individual final team project grade will be factored by the average score of all team members' inputs from these evaluations. Failure to submit a team evaluation will result in the loss of 10 points from your personal team semester project score.

Grade Distribution, Scale & Policies

The grading distribution for course assignments is as follows:

Homework Assignments (6)	15%
Team Backlogs (6)	10%
Team Retrospectives (6)	10%
Module Knowledge Checks (8)	10%
Comprehensive Exam	15%
Semester Project (Team Components)	
(See total grade distribution below)	30%
Team Charter (5%)	
MVP Summary and Demonstration (15%)	
Risk and Opportunity Assessment (5%)	
Project Status Review / project Demonstration (50%)	
Source code and associated documentation (25%)	
Semester Project (Individual Component)	
(See total grade distribution below)	10%
Personal Reflection (project related) (30%)	
*Comprehensive Team Evaluation (2) (35% * 2)*	

NOTE: Graduate students will also be required to create/analyze Agile metrics and create metrics dashboards and reports after each sprint that can be used to communicate project status to all stakeholders. Failure to submit these reports will result in their personal cumulative semester project grade being deducted by 2% for each missed report (6 total).

Total	**100%**

Late Work Policy

Homework/ Knowledge Checks/ Projects: All homework, knowledge checks, and elements of the semester project are due at the time that it is specified in the course schedule and/or D2L content pages. ***Late homework and projects <u>will not</u> be accepted without prior approval by the instructor and will receive 0 points.***

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.

Instructor Grading & Student Appeals Policy

The instructor will make every attempt to provide timely feedback on all assignments, knowledge checks, exams and projects. In most cases, feedback and grades will be given within 72 hours (excluding weekends) of assigned due dates. Rubrics will be provided for all assignments and team projects.

You can dispute any grade that you receive within two weeks from the time the grade was awarded.

If you feel that you have received an unfair assessment of your performance on any given homework assignment, knowledge check, exam or final project, please reach out to the course instructor either in person, via email or over Zoom as soon as possible. Be prepared to provide substantiated claims for your dispute, including any evidence that would support a re-evaluation of your grade.

Grading Scale

The following scale will be used to award final grades:

A	90-100%
B	80-89%
C	70-79%
D	60-69%
E	less than 60%

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.

Course 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.).

University Policies

Links to the following UA policies are available at, https://academicaffairs.arizona.edu/syllabus-policies:

- Absence and Class Participation Policies
- Threatening Behavior Policy
- Accessibility and Accommodations Policy
- Code of Academic Integrity
- Nondiscrimination and Anti-Harassment Policy
- Subject to Change Statement