Carnegie Mellon University
Master of
Software Engineering

17-622: Agile Development

MW, 1:25PM-2:45PM, B2, Fall 2021, 6 Units

Instructor	Email	Office Location & Hours
Prof. Eduardo Miranda	mirandae @ andrew.cmu.edu	By appointment

Course Description. Agile development methods refer to a number of software development approaches that adopt self-organization, adaptive planning, evolutionary development, frequent deliveries and working closely with and incorporating feedback from customers throughout the development process as their principles of operation to achieve responsiveness. This course will introduce students to two well-known agile methods: Scrum and Kanban, connecting their practices to established group dynamics and knowledge management theories to explain why they work and under what circumstances.

The course has been designed for students seeking to acquire a working knowledge of agile project management methodologies, tools, and techniques with a focus on:

- Understanding, validating and defining the work to be done
- Estimating the effort required
- Planning the work
- Tracking and controlling progress
- Reflecting

The course is organized around Scrum and Kanban, two of the most popular agile development method, and follows a learn by doing paradigm so students taking it must be prepared to work in groups during class. Each lecture is typically followed by a class activity in which the concepts learned are put into practice.

Prior Knowledge. Exposure to group software development, undergraduate course in Software Engineering

Learning Objectives. After completing this course, you will be able to:

- Apply the Scrum framework

- Describe the scope of work by means of user stories and story maps
- Estimate the amount of work to be done using the planning poker technique
- Conduct design based planning
- Plan releases using the MoSCoW method
- Use a milestone plan to guide execution
- Make recommendations for improvement
- Understand key ways to measure the success of the processes selected
- Describe the Kanban method

Learning Resources. Reading material is provided.

User Stories Primer, Leffingwell, 2009

Priming Kanban, Boerg, 2012

Improving task breakdown comprehensiveness in agile projects with an Interaction Room, Grapenthin, 2015

Time boxing planning: Buffered Moscow rules, Miranda, 2011

Essential Scrum – Chapters, Rubin, 2013

Context Diagraming, J. Means, 2005

Challenges of Traditional and Agile Software Processes, Sanchez, 2018

The Scrum Guide, Schwaber, 2017

Planning Poker, Trendowics, 2018

Introduction to Disciplined Agile Delivery, Ambler, 2018

Course and Grading Policies. The course features two parallel tracks. A traditional lecture track, where the topics are presented and discussed, and a learn by doing track, the class activities, in which the concepts presented are put into practice through a running assignment performed in groups. See Figure 1. The grading philosophy is explained on Figure 2.

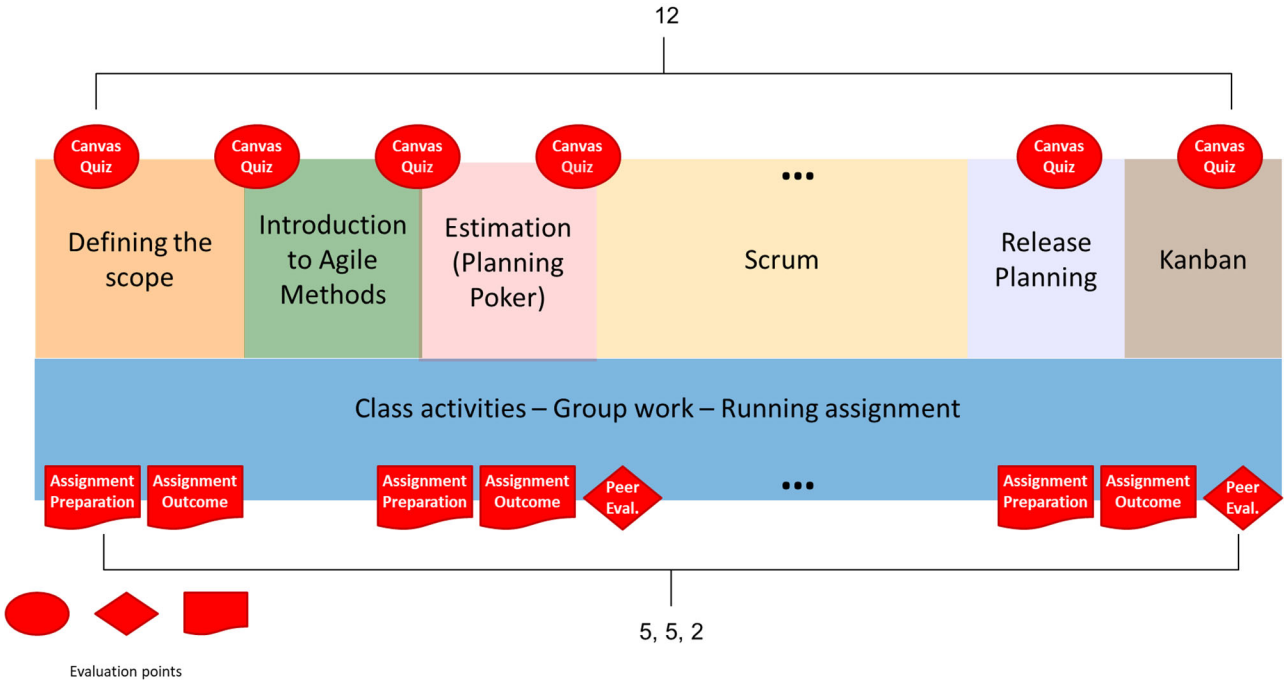

Figure 1 Course architecture

- Low stakes, incremental, self regulated, few exceptions → Many small evaluations
- Allows for less than perfect
- Tolerates a few mishaps. There are no excuses accepted, except for major cause → The total of the points adds to more than 100%, so you can get a few bad grades or miss an assignment or quiz, and still get an "A"
- <u>Penalizes consistent failure to perform</u> → If you consistently miss deliveries, skip classes and get bad grades you will fail the course

Figure 2 Grading philosophy

Final grades in the course will be assigned according to the following scale:

- Maximum number of points = 116
- 110+ points, “A+”
- 100+ points, “A”
- 90+ points, “A-”
- 75+ points, “B+”
- 70+ points, “B”
- 65+ points, “B-”
- 55+, “C”
- “D”

Attendance, quizzes, and assignments

- 5 class activities and quizzes: 0 – 5 points each, 25 points maximum
- 2 peer evaluations, 0 - 10 points each, 20 points maximum
- 7 lecture quizzes: 0 – 3 points each, 21 points maximum
- 3 Individual assignment preparations, 0 – 5 points each, 15 points maximum
- 2 group assignment preparations, 0 – 5 points, 10 points maximum
- 5 group outcome assignment submissions, 0 – 5 points, 25 maximum CANVAS Quizzes

Quizzes serve a double purpose:

- To track class attendance
- To make sure the students comprehend the material presented in class

Lecture quizzes

- Duration 10 minutes, at any point during the class
- Typically, 2 to 3 multiple choice questions referring to what was presented in the slides in the previous lecture and the indicated readings
- One point for taking the quiz (attendance check), up to two points for correctly answering the questions
- Two types of questions:
- Questions testing knowledge of terminology, categories and classifications
- Questions testing principles and generalizations. These questions can have more than one correct response, but there are some better than others

  While discussions during class are welcomed and difference of opinions accepted, due to the ambiguity or lack of definitive definition for many of the concepts taught, answers will be evaluated with regards to what was taught in class.

Class activity quizzes:

- Same as the lecture quizzes, but with 2 points for attendance instead of one

Assignments

- There are 3 types of assignments: Individual preparation, group preparation and group outcome. All submissions must be:
    - In PDF format
    - Self-descriptive
    - Single file
    - Include all elements required by the preparation instructions
    - "Professional grade", you should not submit anything you would not submit or present in a business setting. Readability, presentation and grammar will be graded

- All assignments submissions are due by 11:59PM EST, on the dates indicated in Canvas

Peer evaluations

- Group members will evaluate each other's contribution to the group project. Things to consider include: timely responses to mails and other forms of communication, meeting attendance and punctuality, behavior towards others, and timeliness and quality of work. It is expected that most students will do their fair share. Peer evaluations amount to small percentage of your grade but 100% of your reputation
- Procedure
    - There will be 2 peer evaluations
    - Students will assess whether a team member was a good citizen of the group for the assignments covered. To determine the number of points for each evaluation, the percentage of positive responses will be multiplied by 10. Example, Susie is a member of a 5-person group, if she receives 5 positive votes, she will get a 100% x 10 = 10, but if she gets only 4 positive votes she will get 4 / 5 = 80% x 10 = 8 points
    - Students must only mark students on their group and <u>THEMSELVES</u>. Failing to mark yourself or to fill the evaluation will result in lost points for the said student
    - Evaluations accounting for more people than there is in the group will be discarded on they entirety and in consequence the student doing it, will also lose some points

- Peer evaluations are due by 11:59PM, EST, on the dates indicated in Canvas

Course Schedule. The following schedule provides a general overview of topics and assignments and will be not updated during the course. For actual dates and changes, please refer to the online syllabus in Canvas.

No.	Date	Lecture topic
1	Monday, October 18, 2021	Course introduction, project vs. product oriented development. Agile methods, Scrum, Kanban. Policies, Eberly presentation
2	Wednesday, October 20, 2021	Introduction to Scrum, context diagram & story boards
3	Monday, October 25, 2021	User stories & story maps
4	Wednesday, October 27, 2021	Class activity - Concept of operation
5	Monday, November 1, 2021	Estimation
6	Wednesday, November 3, 2021	Class activity - User stories and story mapping
7	Monday, November 8, 2021	Scrum ceremonies - Sprint planning, Daily Meeting, Backlog refinement, Review meeting, Retrospective meeting
8	Wednesday, November 10, 2021	Class activity - Planning Poker
9	Monday, November 15, 2021	Burndown & Project tracking
10	Wednesday, November 17, 2021	Class Activity - Backlog refinement & sprint planning
11	Monday, November 22, 2021	Release planning & MoSCoW Rules
12	Wednesday, November 24, 2021	Thanksgiving
13	Monday, November 29, 2021	Class Activity - Sprint execution
14	Wednesday, December 1, 2021	Kanban

Accommodations for Students Disabilities. If you have a disability and have an accommodations letter form the Disability Resources office, I encourage you to discuss your accommodations and needs with me as early in the semester as possible. I will work with you to ensure that accommodations are provided as appropriate. If you suspect that you may have a disability and would benefit from accommodations but are not yet registered with the Office of Disability Resources, I encourage you to contact them at access@andrew.cmu.edu.

Academic Integrity. Honesty and transparency are important to good scholarship. Plagiarism and cheating, however, are serious academic offenses with serious consequences. If you are

discovered engaging in either behavior in this course, you will earn a failing grade on the assignment in question, and further disciplinary action may be taken.

For each major assessment, you will be asked to sign a statement affirming that you will not cheat, plagiarize, or receive unpermitted assistance on the work that you turn in. For a clear description of what counts as plagiarism, cheating, and/or the use of unauthorized sources, please see the University's Policy on Academic Integrity.

If you have any questions regarding plagiarism or cheating, please ask me as soon as possible to avoid any misunderstandings. For more information about Carnegie Mellon's standards with respect to academic integrity, you can also check out the Office of Community Standards & Integrity website.

Student Wellness. As a student, you may experience a range of challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may diminish your academic performance and/or reduce your ability to participate in daily activities. CMU services are available, and treatment does work. You can learn more about confidential mental health services available on campus at the Counseling and Psychological Services website. Support is always available (24/7) from Counseling and Psychological Services: 412-268-2922.

This semester is unlike any other. We are all under a lot of stress and uncertainty at this time. Attending Zoom classes all day can take its toll on our mental health. Make sure to move regularly, eat well, and reach out to your support system or me if you need to. We can all benefit from support in times of stress, and this is semester is no exception.

Respect for Diversity. It is my intent that students from all diverse backgrounds and perspective be well served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that students bring to this class be viewed as a resource, strength, and benefit. It is my intent to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know if any of our class meetings conflict with your religious observations so that I can make alternate arrangements for you.

Research to Improve the Course

For this class, I am conducting research on student outcomes. This research will involve your work in this course. You will not be asked to do anything above and beyond the normal learning activities and assignments that are part of this course. You are free not to participate in this research, and your participation will have no influence on your grade for this course or your academic career at CMU. If you do not wish to participate, please send an email to Chad Hershock (hershock@andrew.cmu.edu) with your name and course number. Participants will not receive any compensation. The data collected as part of this research may include student grades. All analyses of data from participants' coursework will be conducted after the course is

over and final grades are submitted. The Eberly Center may provide support on this research project regarding data analysis and interpretation. The Eberly Center for Teaching Excellence & Educational Innovation is located on the CMU-Pittsburgh Campus and its mission is to support the professional development of all CMU instructors regarding teaching and learning. To minimize the risk of breach of confidentiality, the Eberly Center will never have access to data from this course containing your personal identifiers. All data will be analyzed in de-identified form and presented in the aggregate, without any personal identifiers. If you have questions pertaining to your rights as a research participant, or to report concerns to this study, please contact Chad Hershock (hershock@andrew.cmu.edu).