



CSCI 420: SOFTWARE ENGINEERING

DEPARTMENT OF COMPUTER SCIENCE

MILLERSVILLE UNIVERSITY OF PENNSYLVANIA

FALL 2020

INSTRUCTOR

William Killian
Assistant Professor
Roddy 133

(717) 871-4314
william.killian@millersville.edu
cs.millersville.edu/~wkillian

OFFICE HOURS

M---F 10:00AM - 11:00AM
--WR- 10:00AM - 11:30AM
Zoom: 972-1028-2828

SECTION 50A

M---F 12:00PM - 12:50PM
Zoom: 937-6212-1820
--W-- 12:00PM - 1:50PM
Zoom: 921-1309-8172

ZOOM INFORMATION

Office Hours Password
my last name, all lowercase

All Lecture Passwords
software engineering

PREREQUISITES

C- or better in CSCI 330
AND
C- or better in CSCI 362
AND
C- or better in CSCI 366

REQUIRED BOOK(S)

Debugging Teams
B Fitzpatrick, B Collins-Sussman
ISBN: 978-1491932056

COURSE DESCRIPTION

Overview of software engineering concentrating on phases of the software development life cycle including models, agile software development processes, project management, stories and features, specifications, architecture design (APIs, scalability, microservices), specification-based testing, coverage-based testing, and formal verification. Software management topics covered include source control, issue tracking, continuous integration, test automation, quality assurance, and code reviews. Team project provides students with practical experience applying techniques. Offered every semester.

COURSE OUTCOMES

1. Develop experience in working (in various roles) as a member of a software development team.
2. Present technical material to a group
3. Create precise and informative documents related to software development.
4. Differentiate between various processes of software development
5. Apply design patterns to various components of a software project.
6. Compare several approaches to software design (data flow, data structure, object oriented).
7. Apply various testing strategies and evaluate their effectiveness.
8. Recognize the importance of quality assurance and reliability of software systems.
9. Understand professional responsibilities and the software engineering code of ethics.
10. Analyze a situation using the software engineering code of ethics (disseminated through a paper)

GRADING

65% Project 30% Quizzes 5% Ethics Paper

GRADING SCALE

< 60	< 63	< 67	< 70	< 73	< 77	< 80	< 83	< 87	< 90	< 93	< MAX
F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A

NOTES

- A minimum quiz average of **60%** is required to pass the class
- A minimum project grade of **60%** is required to pass the class
- Lack of virtual participation/attendance will result in a grade penalty
- **BONUS** is at the discretion of the professor

COURSE COMPONENTS

Due to the unique situation introduced this term because of the COVID-19 pandemic, I will attempt to run a “flipped classroom” for this course. This means that I will post material ahead of scheduled class periods. During our scheduled lecture periods I will go over examples, case studies, language investigations, and any other topics which are more appropriate for active discussion.

VIDEO RECORDINGS

The bulk of the material for the course will be presented through video recordings. These video recordings will vary in length – ranging between 5 minutes and 60 minutes. I will do my best to have them only cover a single topic. Video Recordings will be assigned prior to a synchronous lecture period. You will be expected to have watched all assigned videos *prior* to the start of the next class. I will post the video recordings on [my website](#) or through MU Video (which is accessible through [D2L](#)).

SYNCHRONOUS MEETINGS / LECTURES

We would normally be in a physical classroom during our scheduled times listed on the schedule. Instead, I will offer synchronous Zoom meetings. Most of these meetings will be discussion centric. Occasionally we may split into breakout rooms to solve various problems or discuss something pertaining to software engineering. Active engagement during these synchronous meetings is expected and mandatory.

STUDENT OUTCOME EVALUATION METRICS

PROJECT

The project is a large-stakes group assessment that will last throughout the entire semester. Software Engineering is a capstone course — some of you are preparing to graduate while others may be in their sophomore year. Use this course as an opportunity to take what you have learned in other courses and apply it here! You will be working in a group with 4-6 members throughout the semester. You will be tasked with creating a *graphical, interactive* application that will act as a testbed for concepts we will be covering throughout the semester. I will not be grading based on comparing one group’s work to another group’s work. The 65% of your overall course grade is split into the following parts:

- 40% Sprint 1 – 4 Evaluation
- 10% Final Code Submission
- 5% Daily Standup Completion
- 5% Weekly Peer Evaluation Completion
- 5% Final Project Presentation

NOTES

- Sprint and Final Code Submission grades will be consistent for all group members
- The StudentRank metric is calculated by a team’s collective weekly peer review
- Each student’s project grade category will be scaled by your StudentRank score
- Weekly peer evaluation is graded only on sincere attempt. Meaningful feedback must be provided to all team members or a grade of zero will be applied
- Weekly daily standup is graded on completion and entered in the gradebook on a weekly basis.

ETHICS PAPER

Medium-stakes paper on the Software Engineering Code of Ethics. This will be assigned prior to the start of our Thanksgiving break. The total length of the paper is expected to be around two pages (single-spaced, 1" margins, 12-pt Times New Roman). **You must submit a paper to pass the class.**

QUIZZES

Medium-stakes written evaluations designed to take about thirty minutes during our scheduled class period on Fridays. Quizzes are not cumulative in terms of topics; however, certain topics have implicit "prerequisites" where prior material covered in the class will be expected to be retained. While taking any online examination the following will be expected of you:

- You must be logged into Zoom
 - You must have your webcam turned on and be visible
 - You must have your microphone turned on
 - You must not be hardware muted or have your microphone turned down
- You must have your computer audio muted with no headphones on
- You must not access any webpage on your computer other than D2L
- You must not reference any notes, be they digital or physical
- You must not communicate, coordinate, or collaborate with anyone
- You must not access any other software on your computer besides Zoom and a web browser

EXPECTATIONS

A course syllabus serves as a contract between you and me.

MY EXPECTATIONS OF YOU

- Arrive prepared and on time for class
- Engage in active discussion during lecture
- Ask questions. Do not hesitate to clarify a concept
- Do your best work and be confident in your abilities
- Check email frequently for announcements and additional information
- Treat everyone with respect
- Adhere to Millersville University's Student Code of Conduct
- Adhere to Millersville University's Academic Honesty Guidelines

Attendance of our synchronous lecture periods is **mandatory**. I encourage everyone to make an active attempt toward participating. Please refrain from using your computer for any other reason than learning during our class period. I will ask you to leave my class if I observe misuse of technology. *Unexcused absences from synchronous lecture periods WILL result in a 1% grade reduction per occurrence.*

YOUR EXPECTATIONS OF ME

- All graded assignments will have a turnaround time of one calendar week.
- You will have one calendar week to contest any published grades in the gradebook.
- Any email or digital communication will be responded to within 24 *weekday* hours.
- No late submissions are acceptable. Period.
- I will be respectful, approachable, and receptive to feedback.

COURSE RESOURCES

ZOOM

<https://millersville.zoom.us>

We will use Zoom for all of our synchronous meetings throughout the semester. Zoom information can be found on the first page of the syllabus. You will want to download the Zoom client rather than just use the website. You will want to “Log in with SSO” and enter [millersville](#) as the organization when logging into Zoom for the first time. The Information Technology Wiki is a great resource to learn more about how to use Zoom. <https://wiki.millersville.edu/display/instructdocs/Zoom>

DISCORD

Yes, *that* Discord. Each team will have their own private Discord server that I will administrate. You will be expected to have all team discussions within the Discord server. Voice channels can be used for peer programming and meetings. Weekday daily standups must occur within Discord.

EMAIL

william.killian@millersville.edu

For any private communication you wish to have with me, you are always welcome to contact me via email. This can be a question, comment, or concern – or for any other reason.

WEBSITE

cs.millersville.edu/~wkillian

My CS webpage has resources and material for the class posted on it (including this very syllabus). Handouts, material, videos, and other resources will be accessible through my webpage.

BRIGHTSPACE D2L

<https://millersville.desire2learn.com>

D2L is the University’s official LMS (Learning Management System). It will be used for announcements, the gradebook, discussions, and assignment submissions.

RESOURCE UNAVAILABILITY

If for any reason any of the above resources are not functioning as they should, please let me know immediately. I can help troubleshoot Zoom. I may be able to resolve issues related to my website.

UNIVERSITY POLICIES

STUDENT CODE OF CONDUCT

The Office of Student Conduct and Community Standards exists to educate students about the expectations of the Millersville University community and to assist students in their development. Millersville University wants to ensure that all of our students have an exceptional, productive and challenging educational experience in a civil and safe environment. Millersville University strives to balancing individual and community rights, while promoting a safe, student centered, and inclusive community. <https://www.millersville.edu/studentconduct/files/studentcodeofconduct.pdf>

ACADEMIC DISHONESTY POLICY

- *Things you may do:*
 - Discuss approaches to solving a problem, as long as the discussion remains *above the level of detail* expected for the course.
 - Seek aid in resolving compiler messages.
 - Email me or visit me during office hours.
 - Go to tutoring to ask about theoretical concepts
- *Things you may not do:*
 - Copy a code fragment verbatim
 - Copy a code fragment and rename variables
 - Visit any website with purchasable solutions
 - Post to or visit websites with resources to problems
 - Obtain any solution on open/closed source repositories
 - Obtain a solution from someone who has previously taken the class
 - Coordinating, collaborating, or communicating during any online evaluation

Copying or observable collaborating on individual assignments is not permitted and may result in failure of the course and expulsion from the University. *Writing code is no different than writing a paper — if it was not your original idea, then you should not submit it as your own work.* This applies to all evaluated assessments. <https://www.millersville.edu/honesty-policy>

TITLE IX

Millersville University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report to the University's Title IX Coordinator incidents of sexual violence shared by students. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. **Faculty members are obligated to report to the person designated in the University Protection of Minors policy sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred.**

Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: <https://www.millersville.edu/titleix>

COURSE SCHEDULE BY WEEK

NOTE: Subject to Change

- Week 01, 08/24 - 08/28: Introduction, Processes of Software Development
- Week 02, 08/31 - 09/04: Processes of Software Development, Versioning, Git
- Week 03, 09/07 - 09/11: Code Reviews, Unit Testing, [Peer Review Due](#), *Guest Speaker*
- Week 04, 09/14 - 09/18: MVC, Functional Testing, [Peer Review Due](#), [Quiz 1](#), [SPRINT 1 DUE](#)
- Week 05, 09/21 - 09/25: MVC, Integration Testing, [Peer Review Due](#), *Guest Speaker*
- Week 06, 09/28 - 10/02: Design Patterns, TDD [Peer Review Due](#), *Guest Speaker*
- Week 07, 10/05 - 10/09: Design Patterns, BDD, [Peer Review Due](#), [Quiz 2](#), [SPRINT 2 DUE](#)
- Week 08, 10/12 - 10/16: APIs, Continuous Integration, [Peer Review Due](#), *Guest Speaker*
- Week 09, 10/19 - 10/23: APIs, Continuous Integration, [Peer Review Due](#), *Guest Speaker*
- Week 10, 10/26 - 10/30: Microservices, Formal Verification, [Peer Review Due](#), [Quiz 3](#), [SPRINT 3 DUE](#)
- Week 11, 11/02 - 11/06: Formal Verification, [Peer Review Due](#), *Guest Speaker*
- Week 12, 11/09 - 11/13: Ethics, [Peer Review Due](#), *Guest Speaker*
- Week 13, 11/16 - 11/20: Ethics, [Peer Review Due](#), [Quiz 4](#), [SPRINT 4 DUE](#)
- Week 14, 11/23 - 11/27: [Peer Review Due](#), FALL BREAK
- Week 15, 11/30 - 12/04: Presentations, [Ethics Paper Due](#), *Guest Speaker*
- Week 16, 12/07 - 12/11: [Peer Review Due](#), Presentations, [FINAL CODE DUE](#)

Our final exam period is on **Thursday December 10th from 12:30PM – 2:30PM**. During this time we will have group presentations.

NOTES

- Quizzes are marked in [Pink](#)
- Surveys are marked in [Blue](#)
- Project assignments are marked in [GREEN](#)
- Paper assignments are marked in [Yellow](#)

COUNSELING RESOURCES

Students sometimes face mental health or drug/alcohol challenges in their academic careers that interfere with their academic performance and goals. Millersville University is a caring community and resources are available to assist students who are dealing with problems. The Counseling Center (717) 871-7821 is an important resource for both mental health and substance abuse issues. Additional resources include: Health Services (717) 871-5250 , Center for Health Education & Promotion (717) 871-4141 , Campus Ministries, and Learning Services (717) 871-5554 .

MY TEACHING PHILOSOPHY

First and foremost, as an educator, my primary role is to support students' well-being. This includes but is not limited to: physical, mental, and emotional health. I am here to help develop students into outstanding individuals. From the academic side, I will teach key concepts related to the computer science curriculum. From the advisement side, I will support students to achieve personal success.

TEACHING METHODS

I will challenge students to do the absolute best work they are able to do, even if they may not have the confidence in their own abilities. I am a proponent of providing captivating lectures through consistent interaction with students and building up lectures as miniature case studies. This methodology molds well to the computer science curriculum since problem solving is a core component of the foundations of computer science.

PRACTICAL SKILLS

In addition to the required course materials covered, I will also cover other practical industry skills. Knowing the theory of computer science is important, but knowing how to leverage that knowledge in industry, academia, or a business setting is also just as crucial. Through the incorporation of real-life application to my lectures, it is my goal that students feel more empowered and ready for any post-graduate position they may pursue.

SELF DETERMINISM

I believe that everyone is capable of achieving greatness. Some concepts will be harder to grasp than others, but I will do my best to engage your mind. I also believe in self mastery. Self mastery does not mean that you will be an expert at everything you do. Instead, self mastery focuses on understanding yourself, specifically your thought process, learning process, and how you react to external events. You should know your strengths and your weaknesses — embrace your strengths and improve upon your weaknesses. Everyone learns in different ways. Even if you may not enjoy the material covered in my lectures, I will do my best to help expand and explore your self-awareness.

WORK-LIFE BALANCE

I know the majority of students are commuting and work part time jobs. When I was a student (here, at Millersville), I also fit into this category. I understand that you wear many hats in your day-to-day life, but I also expect that you will be able to establish a good school-work-life balance. This can be a bit tricky in the beginnings of your college career, but I believe in you! If you want any examples of what to do (and not to do) I can speak from my own experiences.