MARYLAND APPLIED GRADUATE ENGINEERING

Software Engineering (ENPM 611)
Section 0101/SW01

Professor: Dr. Chris Ackermann
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Teaching Assistant: Sarthak Singh
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Office Hours: Tue, Wed, Thu 4-6pm virtual by appointment

Term: Fall 2024
Credits: 3
Course Dates: From August 26, 2024 – December 16, 2024

Section(s)	Course Times	Course Location
Section SW01	Mondays 4:00 - 6:40 PM	TBA

Canvas ELMS Links
Course Page: https://umd.instructure.com/courses/1368613

Course Description
Software engineering concepts, methods, and practices important to both the theorist and the practitioner will be covered. The entire range of responsibilities expected of a software engineer are presented. The fundamental areas of requirements development, software design, programming languages, and testing are covered extensively. Sessions on supporting areas such as systems engineering, project management, and software estimation are also included.

Prerequisites
Competency in one programming language is required and familiarity with Python is very helpful. The course project includes the implementation of an application in Python. Only limited instructions on Python will be provided in class. Programming fundamentals will have to be acquired independently.

Learning Outcomes
This course discusses methods, processes and tools for successfully executing software projects. By the end of this course, you will be able to:
- Describe what it means to develop successful software.
- Define a software developer's set of tasks and challenges.
- Analyze challenges that are introduced when working in teams and interacting with stakeholders.
- Evaluate techniques for designing real-world systems.
- Contrast the fit of different process models for a given development organization and project.

Course Materials

Recommended Text: The lectures in this course are not based on a single book exclusively. Instead, they draw from the general software engineering literature. The book below covers the general topic of software engineering well. Other books and literature will be recommended throughout class to highlight specific topics.
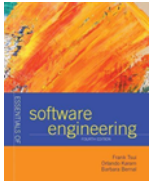
Essentials of Software Engineering, 4th Edition by Frank Tsui, Orlando Karam, Barbara Bernal, 2016, Jones & Bartlett Learning ISBN # 978-1284106008

Laptop: You are free to use your computer to take notes and view the lecture slides during class. Additionally, some lectures will include basic coding exercises. It is helpful to bring a laptop to follow along and to participate in in-class assignments. You must limit your work with your laptop to class related topics.

Communication Guidelines

Communicating with the Instructor
My goal is to be readily available to you throughout the semester. I can be reached by email at chrisumd@umd.edu. Please DO NOT email me with questions that are easily found in the syllabus or on ELMS-Canvas (e.g., When is this assignment due? How much is it worth? etc.), but please DO reach out to me about time-sensitive matters. CANVAS/ELMS discussion boards will be used for questions about the course content and assignments.

Please review These tips for 'How to email a Professor'. By following these guidelines, you will be ensured to receive a timely and courteous response.

Finally, if you need to discuss issues not appropriate for the classroom and/or an email, we can arrange to talk over Zoom or in person. Send me an email asking for a meeting and we can set something up.

Announcements
I will send IMPORTANT messages, announcements, and updates through ELMS-Canvas. To ensure you receive this information in a timely fashion, make sure your email and announcement notifications (including changes in assignments and/or due dates) are enabled in ELMS-Canvas (How to change notification settings in CANVAS).

Log into our ELMs-Canvas course site at least once every 24-hour period to check your inbox and the Announcements page.

Names/Pronouns and Self-Identifications
The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering inclusive and equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to in this class, both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). Keep in mind that the pronouns someone uses are not necessarily indicative of their gender identity. Visit trans.umd.edu to learn more.

Additionally, it is your choice whether to disclose how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

Communicating with your Peers
With a diversity of perspectives and experience, we may find ourselves in disagreement and/or debate with one another. As such, it is important that we agree to conduct ourselves in a professional manner and that we work together to foster and preserve a virtual classroom environment in which we can respectfully discuss and deliberate controversial questions. I encourage you to confidently exercise your right to free speech—bearing in mind, of course, that you will be expected to craft and defend arguments that support your position. Keep in mind, that free speech has its limit and this course is NOT the space for hate speech, harassment, and derogatory language. I will make every reasonable attempt to create an atmosphere in which each student feels comfortable voicing their argument without fear of being personally attacked, mocked, demeaned, or devalued.

Any behavior (including harassment, sexual harassment, and racially and/or culturally derogatory language) that threatens this atmosphere will not be tolerated. Please alert me immediately if you feel threatened, dismissed, or silenced at any point during our semester together and/or if your engagement in discussion has been in some way hindered by the learning environment.

Netiquette Policy
Netiquette is the social code of online classes. Students share a responsibility for the course's learning environment. Creating a cohesive online learning community requires learners to support and assist each other. To craft an open and interactive online learning environment, communication has to be conducted in a professional and courteous manner at all times, guided by common sense, collegiality and basic rules of etiquette.

Grading

Grade Breakdown

Assignments	#	Points Each	Category Total	Category Weight
Quizzes (QZ): short knowledge checks	2	100	200	10%
Team Project (TP): team-based project assignment	1	100	100	40%
Midterm Exam (ME)	1	100	100	20%
Final Exam (FE)	1	100	100	30%
Total			500 points	100%

Course Assignments

A student's performance will be assessed by exercises (quizzes and exams) that focus on individual performance and assignments that are conducted in a team setting (i.e., project assignments). It is expected that students are familiar with online quizzes, how time limits are handled, and how to respond to the different types of questions, including how they are graded. Particularly, multiple answer questions will assign partial points for every correct answer and deduct partial points for every wrong answer. Quizzes and exams may contain free text questions, which requires manual grading. Therefore, results may be posted a few days after submission.

Quizzes. Quizzes are brief learning assessments that are limited to 15 minutes. They contain questions to assess your knowledge in the area that was most recently discussed. Quizzes are taken in class and submitted via Canvas. A total of 2 quizzes will be assigned throughout the class.

Exams. Both the midterm and the final exams are limited to 1 hour and must be completed in-person by in-person students during normal lecture time.

Project Assignment. A project assignment must be completed during the course. The project assignment requires studying a problem description and working independently and with team members to complete the requested artifacts. The project is divided into several parts:

- Project management: manage project tasks via GitHub issues throughout the semester.
- Requirements engineering: develop and prioritize user stories.
- Design: draft a design diagram for the solution to be developed
- Implementation: implement an application to analyze GitHub issues in Python.
- Testing: develop test cases to evaluate implementation

Artifacts will have to be delivered in increments throughout the semester. Important points to note regarding team assignments are:

- The ability of working in a team is part of the assignment. Therefore, it is your responsibility to ensure that all team members contribute equally and that everyone's contribution is properly reviewed.
- Teams will be assigned randomly.
- No adjustments will be made to individual team member's grades based on their level of contribution.

All individual assignments (i.e., quizzes and exams) are to be completed entirely independently of classmates. Discussions of any material from quizzes and exams during the availability period thereof is strictly prohibited. All class material and other literature (including online) can be used to answer quiz and exam questions as well as to respond to project assignments. Of course, collaboration amongst members of a team is required and encouraged for the team project assignment.

No extra assignments will be given to improve poor performance in class. The class assignments provide sufficient opportunity to demonstrate both individual and group performance.

Grading Assignments
All assignments will be graded according to a predetermined set of criteria (i.e., rubric) which will be communicated to students before the assignment is submitted.

To progress satisfactorily in this class, students need to receive timely feedback. To that end, it is my intention to grade all quizzes and exams within **7 days** of their due date and the project assignment within 2 weeks of its due date. If an assignment is taking longer than expected to grade, students will be informed of when they can expect to see their grade.

Grade Computation
All assessment scores will be posted on ELMS/Canvas page. If you would like to review any of your grades (including the exams), or have questions about how something was scored, please email me to schedule a time for us to meet and discuss. Note that Canvas does not accurately calculate the final grade. To determine your final grade, you should calculate it using the weights provided above.

It is expected that you will submit work by the deadline listed in the syllabus and/or on ELMS-Canvas. Late work will be penalized according to the late work policy described in the **Course Policies and Procedures** section below.

Grade Disputes: I am happy to discuss any of your grades with you, and if I have made a mistake, I will immediately correct it. Any formal grade disputes must be submitted in writing and within one week of receiving the grade.

Final letter grades are assigned based on the percentage of total assessment points earned. To be fair to everyone I have established clear standards and apply them consistently, so please understand that being close to a cutoff is not the same as making the cut (89.99 ≠ 90.00). It would be unethical to make exceptions for some and not others.

Final Grade Cutoffs							
A	91.00%	B	80.00%	C	74.00%	D	60.00%	F	<60.0%

Course Schedule

Week	Date	Topic	Deliverable
1	8/26/2024	Introduction to Software Engineering	
2	9/2/2024	Labor Day	
3	9/9/2024	Introduction to Software Processes	
4	9/16/2024	Software Requirements	Quiz #1 (in class)
5	9/23/2024	Software Requirements	
6	9/30/2024	Architecture Design	
7	10/7/2024	Midterm	Midterm (in class)
8	10/14/2024	Detailed Design	
9	10/21/2024	Traditional Process Models	
10	10/28/2024	Agile Process Models	
11	11/4/2024	Implementation	Quiz #2 (in class)
12	11/11/2024	Software Testing	
13	11/18/2024	Software Testing	
14	11/25/2024	Deployment & Maintenance	Final project artifacts - Due
15	12/2/2024	Project management	
16	12/9/2024	Class Summary	
17	12/16/2024	Final Exam	Final Exam (in class)

Note: This is a tentative schedule, and subject to change as necessary – monitor ELMS-Canvas for current deadlines. In the unlikely event of a prolonged university closing, or an extended absence from the university, adjustments to the course schedule, deadlines, and assignments will be made based on the duration of the closing and the specific dates missed.

Last updated 7/26/2024

Course Policies and Procedures

The University of Maryland's conduct policy indicates that course syllabi should refer to a webpage of course-related policies and procedures. For a complete list of graduate course related policies, visit the Graduate School website. Below are course-specific policies and procedures which explain how these Graduate School policies will be implemented in this class.

Satisfactory Performance
The Graduate School expects students to take full responsibility for their academic work and academic progress. The student, to progress satisfactorily, must meet all the academic requirements of this course. Additionally, each student is expected to complete all readings and any preparatory work before each class session, come to class prepared to make substantive contributions to the learning experience, and to proactively communicate with the instructor when challenges or issues arise.

Questions about Assignments
Please ask all questions you may have about an assignment by 1PM the day before the assignment is due. Any questions asked after that time may not be answered in time for you to make changes to your work.

Late Work Policy
Assignments should be completed by the due date and time listed with the assignment, on the syllabus, and/or in the course calendar. If you are unable to complete an assignment by the stated due date, it is your responsibility to contact your instructor to discuss an extension, at least 24 hours BEFORE the assignment is due. Extensions are not guaranteed but may be granted at the instructor's discretion.

Unexpected late assignment submissions suffer a loss of 20% of the total value off the top for each day late. For example, an assignment handed in one day late can get at most 80% of the total points.

Religious Observance
It is the student's responsibility to inform the instructor of any intended absences for religious observances in advance. Notice should be provided as soon as possible but no later than the end of the schedule adjustment period.

Academic Integrity
For this course, some of your assignments will be collected via Turnitin on ELMS/Canvas. I have chosen to use this tool because it can help you improve your scholarly writing and help me verify the integrity of student work. For information about Turnitin, how it works, and the feedback reports you may have access to, visit Turnitin Originality Checker for Students

The University's Code of Academic Integrity is designed to ensure that the principles of academic honesty and integrity are upheld. In accordance with this code, the University of Maryland does not tolerate academic dishonesty. Please ensure that you fully understand this code and its implications because all acts of academic dishonesty will be dealt with in accordance with the provisions of this code. All students are expected to adhere to this Code. It is your responsibility to read it and know what it says, so you can start your professional life on the right path. **As future professionals, your commitment to high ethical standards and honesty begins with your time at the University of Maryland.**

It is important to note that course assistance websites, such as CourseHero, or AI generated content are not permitted sources, unless the instructor explicitly gives permission. Material taken or copied from these sites can be deemed unauthorized material and a violation of academic integrity. These sites offer information that might be inaccurate or biased and most importantly, relying on restricted sources will hamper your learning process, particularly the critical thinking steps necessary for college-level assignments.

Additionally, students may naturally choose to use online forums for course-wide discussions (e.g., Group lists or chats) to discuss concepts in the course. However**, collaboration on graded assignments is strictly prohibited unless otherwise stated**. Examples of prohibited collaboration include: asking classmates for answers on quizzes or exams, asking for access codes to clicker polls, etc. Please visit the **Office of Graduate Studies' full list of campus-wide policies** and reach out if you have questions.

Finally, on each exam or assignment you must write out and sign the following pledge: *"I pledge on my honor that I have not given or received any unauthorized assistance on this exam/assignment."*

If you ever feel pressured to comply with someone else's academic integrity violation, please reach out to me straight away. Also, *if you are ever unclear* about acceptable levels of collaboration, *please ask*!

To help you avoid unintentional violations, *the following table* lists levels of collaboration that are acceptable for each graded exercise. Each assignment will contain more specific information regarding acceptable levels of collaboration.

	OPEN NOTES	USE BOOK	LEARN ONLINE	GATHER CONTENT With AI	ASK FRIENDS	WORK IN GROUPS
Quizzes	✓	✓	✓	---	---	---
Midterm Exam	✓	✓	✓	---	---	---
Team Project	✓	✓	✓	✓	✓	✓
Final Exam	✓	✓	✓	---	---	---

Course Evaluation
Please submit a course evaluation through Student Feedback on Course Experiences in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to Course Experiences is confidential. Campus will notify you when Student Feedback on Course Experiences is open for you to complete your evaluations at the end of the semester. Please go directly to the **Student Feedback on Course Experiences** to complete your evaluations. By completing all of your evaluations

each semester, you will have the privilege of accessing through Testudo the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

Copyright Notice
Course materials are copyrighted and may not be reproduced for anything other than personal use without written permission.

Tips for Succeeding in this Course

1. **Participate.** I invite you to engage deeply, ask questions, and talk about the course content with your classmates. You can learn a great deal from discussing ideas and perspectives with your peers and professor. Participation can also help you articulate your thoughts and develop critical thinking skills.
2. **Manage your time.** Students are often very busy, and I understand that you have obligations outside of this class. However, students do best when they plan adequate time that is devoted to course work. Block your schedule and set aside plenty of time to complete assignments including extra time to handle any technology related problems.
3. **Login regularly.** I recommend that you log in to ELMS-Canvas several times a week to view announcements, discussion posts and replies to your posts. You may need to log in multiple times a day when group submissions are due.
4. **Do not fall behind.** This class moves at a quick pace and each week builds on the previous content. If you feel you are starting to fall behind, check in with the instructor as soon as possible so we can troubleshoot together. It will be hard to keep up with the course content if you fall behind in the pre-work or post-work.
5. **Use ELMS-Canvas notification settings.** Pro tip! Canvas ELMS-Canvas can ensure you receive timely notifications in your email or via text. Be sure to enable announcements to be sent instantly or daily.
6. **Ask for help if needed.** If you need help with ELMS-Canvas or other technology, IT Support. If you are struggling with a course concept, reach out to me and your classmates for support.

Student Resources and Services

Taking personal responsibility for your learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come talk to me so that I can help you find the right approach to success in this course, and I encourage you to visit the Counseling Center's Academic Resources to learn more about the wide range of resources available to you. Below are some additional resources and services commonly used by graduate students. For a more comprehensive list, please visit the Graduate School's Campus Resources Page.

Accessibility and Disability Services
The University of Maryland is committed to creating and maintaining a welcoming and inclusive educational, working, and living environment for people of all abilities. The University of Maryland is also committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to discrimination. The Accessibility & Disability Service (ADS) provides reasonable accommodations to qualified individuals to provide equal access to services, programs and activities. ADS cannot assist retroactively, so it is generally best to request accommodations several weeks

before the semester begins or as soon as a disability becomes known. Any student who needs accommodations should contact me as soon as possible so that I have sufficient time to make arrangements.

For assistance in obtaining an accommodation, contact Accessibility and Disability Service at 301-314-7682, or email them at adsfrontdesk@umd.edu. Information about sharing your accommodations with instructors, note taking assistance and more is available from the Counseling Center.

Writing Center
Everyone can use some help sharpening their communication skills (and improving their grade) by visiting The Graduate School's Writing Center and schedule an appointment with them. Additionally, international graduate students may want to take advantage of the Graduate School's free English Editing for International Graduate Students (EEIGS) program.

Health Services
The University offers a variety of physical and mental health services to students. If you are feeling ill or need non-emergency medical attention, please visit the University Health Center.

If you feel it would be helpful to have someone to talk to, visit UMD's Counseling Center or one of the many other mental health resources on campus.

Notice of Mandatory Reporting
Notice of mandatory reporting of sexual assault, sexual harassment, interpersonal violence, and stalking: As a faculty member, I am designated as a "Responsible University Employee," and I must report all disclosures of sexual assault, sexual harassment, interpersonal violence, and stalking to UMD's Title IX Coordinator per University Policy on Sexual Harassment and Other Sexual Misconduct.

If you wish to speak with someone confidentially, please contact one of UMD's confidential resources, such as CARE to Stop Violence (located on the Ground Floor of the Health Center) at 301-741-3442 or the Counseling Center (located at the Shoemaker Building) at 301-314-7651.

You may also seek assistance or supportive measures from UMD's Title IX Coordinator, Angela Nastase, by calling 301-405-1142, or emailing titleIXcoordinator@umd.edu.
To view further information on the above, please visit the Office of Civil Rights and Sexual Misconduct's website at ocrsm.umd.edu.

Basic Needs Security
If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live, please visit UMD's Division of Student Affairs website for information about resources the campus offers you and let me know if I can help in any way.

Veteran Resources
UMD provides some additional supports to our student veterans. You can access those resources at the office of Veteran Student life and the Counseling Center. Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities) are welcome and encouraged to communicate these, in advance if possible, to the instructor.