CPSC:480 Software Engineering (SWE) Fall 2022

Lecture: Monday and Wednesday 5:15-6:30PM, Arts & Sciences (CAS) 134
Dates: Aug 22-Nov 30. No class Labor Day, Sept 5. Non-examinable topics Nov 23.
Instructor: Jonathan (JD) Kilgallin, jdk72@uakron.edu, jd.kilgallin@keyfactor.com
Office: CAS 230, Wednesday 6:45-7:45 or by appointment
Homepage: https://github.com/kilgallin/SWEF22
Prerequisites**:** Minimum C- in 3460:210 Computer Science II
Textbook: Pressman, Roger S. *Software Engineering: A Practitioner's Approach, 9th edition*. McGraw-Hill Education, 2019. ISBN 978-1-259-87297-6. Paper/digital.
Technology**:** Students are recommended to bring a laptop to class.

Course Description
A comprehensive overview of the software development lifecycle as a business process with phases including requirements definition, analysis, design, implementation, testing & validation, release, maintenance, and evolution, as well as related principles, methodologies, tools, and their application.

Learning Objectives
Students who complete the course can:

- Demonstrate the ability to perform standard software development procedures such as issue tracking, testing program code, code reviews, program refactoring, and documentation as part of a team.
- Explain and contrast development process models and methodologies.
- Create a project plan with requirements, estimates and documentation.
- Effectively use version control systems to collaborate on software projects.
- Apply standard techniques for managing and addressing software defects.
- Understand and describe standard terminology related to the software engineering discipline.
- Understand vulnerabilities and risks involved in software engineering.
- Describe typical roles and responsibilities in a software engineering team.
- Describe functional and non-functional requirements and concept location within code.

Grading

In-class exercises & quizzes	20%	Midterm	20%
Projects	40%	Final	20%

A	≥ 90.0%	B-	≥ 78.5%	D+	≥ 60.0%
A-	≥ 88.5%	C+	≥ 77.0%	D	≥ 55.0%
B+	≥ 87.0%	C	≥ 70.0%	D-	≥ 50.0%
B	≥ 80.0%	C-	≥ 65.0%	F	< 50.0%

Cutoffs

Final grades will be rounded up to the nearest tenth of a percent. Extra credit available to all students may be offered on some assignments and exams. Exam grades will be curved up at instructor's discretion. Up to 1% extra credit may be earned through participation, recorded monthly. No additional extra credit, grade rounding or adjustment on a case-by-case basis will be performed.

In-class Exercises and Quizzes

Six in-class exercises will focus on key software development skills and make up 10% of overall grades. Quizzes and other in-class assessments occur frequently and are another 10% of the overall score. Attendance is necessary to receive credit for exercises performed during class. The lowest exercise score and lowest quiz score will be dropped in computing final grade.

Projects

Four projects are assigned and collectively are 40% of the overall score (10% each). They include creating artifacts of the software engineering process and performing software engineering tasks. Project grades include correctness, readability, design style, quality of design, and application of concepts presented in the course. Three projects include collaborative work with a team of other students. Project teams may change at instructor's discretion. Students within a team may be graded independently based on individual contributions.

Midterm

The Midterm Exam is 20% of overall grade. It will occur during regular lecture on Oct 5 (week 7), subject to change. Office hours will be on Monday that week.

Final Exam

The Final Exam is 20% of overall grade. It will occur Dec 7, 5:15-7:15, in CAS 134.

Calendar

Initial plans for course agenda. Dates and topics are subject to change.

08/22 Intro – Course info, policies, topics overview, instructor bio

08/24 History & Core Concepts (Ch 1) – Definitions, history of software

08/29 Lifecycle (Ch 2-4) – Software development processes and phases

08/31 Software Development Teams (Ch 5+24) – Organization, application

+Project 1 – Software Engineering Roles & GitHub assigned

09/05 -Labor Day- No class

09/07 Tools – Development & project management tools, version control

09/12 GitHub exercise – In-class online exercise #1

09/14 Requirements Engineering (Ch 7-8) – Analyzing and managing reqs.

+Project 2 – Product Design assigned

09/18 Project 1 – Software Engineering Roles & GitHub due

09/19 Project Planning (Ch 6+25) – Scoping, estimating, scheduling

09/21 Planning exercise – In-class online exercise #2

09/26 Product Design (Ch 9-11) – Modeling architecture & components

09/28 Design exercise – In-class online exercise #3

10/02 Project 2 – Product Design checkpoint

10/03 Formal specification and validation – Mathematical models

+Midterm Review

+Special office hour

10/05 Midterm

10/09 Project 2 – Product Design due

10/10 Code concerns – Security, privacy, performance, logging, etc

10/12 Code concerns exercise – In-class online exercise #4

10/17 Code Reviews – Style & standards, maintainability, collaboration

10/19 Code reviews exercise – In-class online exercise #5

+Project 3 – Code Review, Bugs, and Testing assigned

10/24 Complexity (Ch 14) – Architecture, measurement, refactoring

10/26 Bugs (Ch 15-16) – Identifying bugs, tracking bugs, analyzing defects

10/31 Testing (Ch 17) – Types of tests, who writes them, when and why

11/02 Testing Exercise – In-class online exercise #6

11/06 Project 3 – Code Review, Bugs, and Testing checkpoint

11/07 Automation (Ch 19-20) – Using software to improve writing software

+Project 4 – Complete Development Sprint assigned

11/09 SCM (Ch 22+27) – Building, releasing, deploying software

11/13 Project 3 – Code Review, Bugs, and Testing due

11/14 Risk (Ch 18+26) – Uncertainty, security, technical & project risks

11/16 UX+Solution Engineering (Ch 12) – Satisfying users' needs

11/21 Other (Ch 23, 28, 29) – Research, marketing, sysadmin, support

11/23 Python (App 2) – Python for interviews, automation, & data science

11/27 Project 4 – Complete Development Sprint checkpoint

11/28 Final project presentations – Student presentations on project 4

11/30 Final review (Ch 30) – Summary of course content and exam prep

12/02 Project 4 – Complete Development Sprint due

12/07 Final exam – Cumulative with focus on post-midterm topics

Policies

Attendance – The course involves collaborative team activities. Full credit requires attendance and participation.

Submission – Any source code or other artifact created for this course is to be committed to a Git repository created through GitHub. Other submissions will occur on Brightspace. For credit, the work must follow submission instructions.

Make-up – So that work can be graded and returned promptly, late assignments require a valid excuse. It is up to the student to make up any missed material. Make-ups of any work for this class are given only with an excused absence or a documented, valid emergency. Please contact me if an emergency arises.

Registration – Students whose names are not on the University's official 15-day class list are not permitted to attend class. Consult University information for specific dates and policies regarding withdrawal.

Academic Honesty – All submitted work (exercises, projects, quizzes and exams) must be your own. Submission of work that is even partly not yours results in a report to the *Office of Student Conduct and Community Standards*.

Accommodations – Any student who feels she/he may need an accommodation based on the impact of a disability should contact the Office of Accessibility at 330-972-7928. The office is at 105 Simmons Hall.

Title IX – The University of Akron is committed to providing an environment free of all forms of discrimination, including sexual violence and sexual harassment. This includes instances of attempted and/or completed sexual assault, domestic and dating violence, gender-based stalking, and sexual harassment. Additional information, resources, support and the University of Akron protocols for responding to sexual violence are available at uakron.edu/Title-IX.

Other – All applicable University policies will be enforced. See uakron.edu/oaa/faculty-affairs/What-students-need-to-know

COVID-19 – The COVID-19 pandemic is still present and serious. Before entering class, you should have completed your daily health assessment. You should not come to class if you fail your health check or feel ill. At that time, I also ask you notify me that you will be absent. When campus policies require masks to be worn indoors, all students are required to wear a mask during in-person classes. While you are in class on campus, you are required to: always cough or sneeze into your elbow or a tissue and adhere to other public safety protocols and directives for your specific classroom/lab/ studio. Students who do not follow these health and safety requirements will be instructed to leave class immediately. Students who violate this protocol will need to leave the classroom and MAY be marked absent. Repeated violations of these health-saving protocols may lead to sanctions under the Student Code of Conduct up to and including suspension or expulsion. Current guidelines can be found at: uakron.edu/return-to-campus/.