

# Foundations of Software Engineering

## Spring 2025

COMP-7012-001

Monday, Wednesday 12:40–2:05 p.m.  
Dunn Hall 124

<https://comp-7012-s25.github.io/>

*Please send all emails to all instructors and TAs, and reply-all to all emails.*

Instructor: Dr. Scott Fleming <[Scott.Fleming@memphis.edu](mailto:Scott.Fleming@memphis.edu)>

Office Hours: By appointment; no set hours, but I will make every effort to respond to messages within one business day

Office: Dunn Hall 375; meetings held in [Teams](#),  
or in person by special appointment

Teaching Assistant: Md Muminul Hossain <[Md.Muminul.Hossain@memphis.edu](mailto:Md.Muminul.Hossain@memphis.edu)>

Consulting Hours: By appointment; meetings held in [Teams](#)

## 1 Catalog Description

Covers project management; software disciplines (requirements, analysis, design, implementation, testing); software modeling notations; mapping designs to code. Students work in teams to develop a significant software system.

## 2 Topics

The course will emphasize the following topics (a subset of the knowledge areas in the [Guide to the Software Engineering Body of Knowledge](#)):

- **Software Requirements**, including elicitation, specification, and validation
- **Software Design**, including principles, methods, patterns, and notations
- **Software Construction**, including tools, platforms, and APIs
- **Software Testing**, including levels, techniques, and measures
- **Software Maintenance**, including types and cost
- **Software Configuration Management**, including version control
- **Software Engineering Management**, including planning and estimation
- **Software Engineering Process**, including life-cycle models and assessment

## 3 Course Outcomes

The following are some key learning goals that students in the course are expected to achieve:

1. Use modern software development tools (e.g., Git) to perform effective configuration management.
2. Design and model software using modern modeling languages and notations (e.g., UML).
3. Convey ideas orally through presentations to peers, clients, and faculty.
4. Gather and specify software requirements (e.g., as user stories).

5. Apply a modern software engineering process (e.g., Scrum) to the development of a software project.
6. Produce high-quality software-development artifacts for each phase of the development cycle.
7. Apply modern software testing tools and techniques (e.g., black- and white-box testing).
8. Develop software in collaborative teams.
9. Plan work and to distribute tasks among team members to maximize team productivity.

## 4 Required Equipment

Students will be required to bring a laptop computer to lecture and to have a computer to do the work required for the course.

System Requirements:

- Must have a webcam.
- Capable of simultaneously recording screen-capture and webcam video while running Rails web development tools.

## 5 Required Textbooks

No textbooks are required for this course. All reading materials will be provided by the instructor.

## 6 Evaluation

The **final grade** in the course will be based on the grades received for each of the following **performance criteria**.

- Attendance and Participation
- Skills Assignments
- Software Requirements and Design
- Project Teamwork
- Project Individual Work

For each criterion, a letter grade (A+, A, A-, etc.) will be assigned, and the final grade will be assigned as follows.

- The final grade will be the **lowest performance-criterion grade** earned. The rationale for using the lowest performance-criterion grade as the basis for the final grade is that the final grade is understood to reflect performance across *all criteria* – for example, to earn a final grade of A indicates that A-level performance was achieved on all criteria. To put it another way, failure to achieve A-level performance on a criterion indicates that a student's overall performance was not at the A level.
- If **half or more** (i.e., 3 or more) of the performance-criterion grades are higher than the lowest performance-criterion grade, then the final grade shall be increased by “half” a letter grade (A → A+, A- → A, B+ → A-, etc.). The rationale for this small increase is to account for the fact that overall performance tended to be above the minimum performance-criterion grade earned.

### 6.1 Attendance and Participation

Lecture attendance, engagement, and participation in the course are critical for learning and thus required. The number of **unexcused absences** from class a student has will be recorded. Arriving

to class more than 20 minutes late will be counted as an absence. Furthermore, a student will receive a **participation demerit** for each instance in which they fail to meet expectations for participation.

### 6.1.1 Excused Absences

To have an absence excused, two criteria must be met:

- **Allowable Reason:** The reason for the absence must be an allowable extenuating circumstance. The instructor will determine if the reason is allowable. Things like an illness or the death of a close relative are typically allowable. Things like attending a wedding or taking a vacation are typically not allowable.
- **Documentation:** Documented evidence confirming the reason for the absence must be provided. The instructor will determine what documentation will be acceptable. One common acceptable form of documentation for an illness is a doctor's note – if you see a doctor, always ask for one!

### 6.1.2 Participation Demerits

Some common participation demerits include (but are not limited to) the following.

- **Tardiness:** Each time a student arrives late to class, they will receive a demerit. Also, students are not allowed to enter the classroom beyond the first 20 minutes of class. *Come to class on time or don't come at all!*
- **Activities:** Following educational best practices, there will be numerous in-class activities for students complete. Failure to complete an activity by the appointed deadline will result in a participation demerit.
- **Laptop Requirement:** Students are required to bring a laptop with a functioning development environment to each class, so they can fully participate and benefit from in-class activities. For each class that a student does not bring a functioning laptop, they will receive a participation demerit.
- **Special Days:** Certain days will be designated as special—for example, days on which assessments are administered, or student presentations are given. An unexcused absence on such days will result in an additional participation demerit.

### 6.1.3 Attendance and Participation Letter Grade

The **minimum requirements** for each Attendance and Participation letter grade are as follows.

Grade	Unexcused Absences	Participation Demerits
A+	0	0
A	3	3
A-	4	4
B+	4	5
B	5	5
B-	6	6
C+	6	7
C	7	7
C-	8	8
D+	8	9
D	9	9

As shown in the above table, 3 unexcused absences are allowed without penalty (A+ and A both earn 4.0 quality points in the university's GPA calculation). Having more than 3 unexcused absences may cause a student's grade to suffer. Similarly, having more than 3 participation demerits may also hurt a student's grade.

## 6.2 Skills Assignments (SAs)

Skills Assignments have students perform actual software construction tasks using their laptop development environments. A key aim of the SAs is to help each student acquire the software design and construction skills needed to perform core development tasks quickly and correctly. Such skill and efficiency are essential to being an effective software project team member.

### 6.2.1 SA Parts

There are typically three parts to each SA.

- **Active Reading (AR):** Read and perform the steps in a specified set of coding demos.
- **Practice Test (PT):** An in-class activity in which students practice the skills they learned in the AR by completing a new task.
- **Explanation Video (EV):** Students will record themselves performing a third task, and they will explain each step they perform as they perform it.

### 6.2.2 SA Submission Opportunities and Deadlines

An important part of the learning process for many students is making mistakes from which the student can learn and improve. In recognition of this fact, students will be offered up to **3 opportunities** to pass each part of an SA. Each opportunity will have its own designated submission window and deadline. ***Deadlines are strict, and late work will not be accepted.***

### 6.2.3 SA Grading

Each individual SA will be graded as High-Pass/Low-Pass/Fail. Each part of an SA will be graded as Pass/Fail. The **minimum requirements** to receive each SA grade are as follows.

- **High-Pass:** All SA parts earn Pass grades on the first or second submission opportunity.
- **Low-Pass:** All SA parts earn Pass grades, with some being on the third submission opportunity.

***Warning! A Fail grade on any part of an SA will result in a Fail grade for the entire SA.***

### 6.2.4 Skills Assignment Letter Grade

The **minimum requirements** for each Skills Assignment letter grade are as follows. There are 6 SAs, and the numbers below indicate the min/max number of SAs for which the corresponding grade is earned.

Grade	Minimum Requirements		
	High-Pass (min)	Low-Pass (max)	Fail (max)
A+	6	0	0
A	4	2	0
A-	3	3	0
B+	0	6	0
	5	0	1
B	3	2	1
B-	2	3	1
C+	0	5	1
	4	0	2
C	2	2	2
C-	1	3	2
D+	0	4	2
	3	0	3
D	0	3	3

### 6.3 Team Project

The centerpiece of this course is a team software project in which teams of roughly 4 students will work together to develop a software system. Three of the performance-criterion grades are based on work done for the project:

- Software Requirements and Design
- Project Teamwork
- Project Individual Work

Team projects in an educational setting must balance two concerns: (1) the need for students to work together as cohesive teams, and (2) the need for individual accountability. Thus, some of the project-based grades will be based on what the team as a whole is able to achieve, and some will be based on each student's individual contributions to the project.

#### 6.3.1 Team Achievement

Teams will complete a series of project milestones (M0, M1, and M2), each with its own goals and instructions. Milestones will be evaluated based on criteria, which include the following:

- Quality of planning and design artifacts
- Effectiveness of communication
- Discipline in following software engineering processes and workflows

The grades for such items will typically be applied to the team as a whole (i.e., everyone on the team will receive the same marks).

#### 6.3.2 Individual Work

Each team member will be assigned certain tasks for each milestone, and it is expected that they will complete their assigned tasks in a timely manner. It is also expected that team members will be continuously productive, and not to put off their work, rushing to slap something together at the last minute.

- **Late Work:** Team members are expected to complete work on schedule, as deadlines are a part of the real world. Work will not be accepted late unless there are allowable extenuating circumstances and prior arrangements are made the instructor.

## 7 Academic Integrity

The University of Memphis expects all student to behave honestly. The [Student Code of Rights and Responsibilities](#) explains what constitutes a violation of our Academic Integrity policy.

Please see the Office of Student Accountability's website for more information:

<https://www.memphis.edu/osa/>. Plagiarism, cheating, and other forms of academic dishonesty are prohibited. Students who violate the academic misconduct policy, either directly or indirectly, through participation or assistance, are immediately responsible to the instructor of the class in addition to other possible disciplinary sanctions which may be imposed through the regular institutional disciplinary procedures.

Examples of academic dishonesty include, but are not limited to:

- Cheating – A student uses a smart phone to access the internet while taking a quiz.
- Copyright infringement – A student uses a photograph found on the internet in a presentation without obtaining permission from the photographer.
- Deception – A student gives a dishonest excuse when asking for a deadline extension.

- Denying access to information or material – A student makes library or shared resource material unavailable to others by deliberately misplacing those resources.
- Fabrication – A student invents data in an academic work.
- Facilitating academic misconduct – A student knowingly allows a portion of their work to be used by another student.
- Plagiarism – A student represents the ideas of another in a paper without citing and referencing the work or a student turns in the same or nearly the same assignment for credit in more than one class.
- Sabotage – A student prevents others from completing their work by opening a window to affect a temperature controlled experiment.
- Unauthorized collaboration – A student works with other students on a paper without the specific permission of the instructor.

### 7.1 Course-Specific Integrity Policies

*Any student caught cheating in the course will receive an F grade and be reported to the [Office of Student Accountability](#) (full stop).*

- Teammates (i.e., members of the same team) may collaborate and share work however they see fit; however, if asked to report what each team member's contributions were, **students must provide honest responses**.
- Students from different teams may not collaborate in this way.
- Teammate collaboration is limited to project work and is not allowed on any other course work (e.g., homeworks, quizzes, exams), unless specifically noted.

## 8 Classroom Behavior

Students should be aware of the [Student Code of Rights and Responsibilities](#) which describes examples of unacceptable classroom behavior. Disruptive classroom behavior will not be tolerated. Instructors are empowered to remove students from class and refer behaviors for sanctioning to the Office of Student Accountability.

### 8.1 Course-Specific Classroom Policies

- Students must **remain silent while the instructor is lecturing**. Questions and discussion are welcome, but students must raise their hands and be given permission to speak.
- When students carry on conversations among themselves while the instructor is lecturing, it is disruptive to the class.
- Students caught engaging in this behavior will be told to leave the classroom immediately, and their final grade will be reduced by a full grade (e.g., an A would become a B).
- A second offence will be considered a pattern of disruptive behavior and will be treated as **student misconduct**, resulting in an F in the course and being reported to the Office of Student Accountability.

## 9 Equity, Inclusion, and Accommodations

Our class respects all forms of diversity. The University of Memphis embraces the diversity of students, faculty, and staff, honors the inherent dignity of each individual, and welcomes their unique perspectives, behaviors, and worldviews. In this course, people of all races, religions, national origins, sexual orientations, ethnicities, genders and gender identities, cognitive, physical, and behavioral abilities, socioeconomic backgrounds, regions, immigrant statuses,

military or veteran statuses, size and/or shapes are strongly encouraged to share their rich array of perspectives and experiences. Course content and campus discussions will heighten your awareness to each other's individual and intersecting identities. In accordance with [UofM Policy GE2004](#), the University will ensure students receive consistent and fair treatment and affirmation of the University's commitment to diversity. The University prohibits discrimination and harassment based on protected characteristics as stated in [UofM Policy GE2030](#).

Please see the instructor if you need accommodations for a disability, or to fulfill cultural or religious obligations. Students with requests for accommodations should contact [Disability Resources for Students](#) to register and learn about the services available to support their learning. Students with disabilities are encouraged to speak with us privately about academic and classroom accommodations. It is strongly encouraged that you register with Disability Resources for Students (DRS) to determine appropriate academic accommodations. Disability Resources for Students is located in 110 Wilder Tower, their phone number is (901) 678-2880 (V/TTY), their email is [drs@memphis.edu](mailto:drs@memphis.edu), and their website is <https://www.memphis.edu/drs/>. Disability Resources for Students coordinates all accommodations for students with disabilities.

Qualified students with disabilities will be provided reasonable and necessary academic accommodations if determined eligible by the appropriate Disability Resources for Students staff at the University. Prior to granting disability accommodations in this course, the instructor must receive written verification of a student's eligibility for specific accommodations from the Disability Resources for Students staff at the University. It is the student's responsibility to initiate contact with University's Disability Resources for Students staff and to follow the established procedures for having the accommodation notice sent to the instructor.

## **10 Mental Health**

As a student you can sometimes feel overwhelmed, lost, experience anxiety or depression, and struggle with relationship difficulties or diminished self-esteem. Mental health challenges can interfere with optimal academic performance. However, many of these issues can be effectively addressed with some help. If you find yourself struggling with your mental or physical health this semester, please feel free to approach me. I will try to be flexible and accommodating. As your instructor, I am not qualified to serve as a counselor, but UofM offers confidential counseling services on-campus and via telehealth that are available to students taking six or more credits at no cost. UofM Counseling Center is staffed by experienced, professional psychologists, clinical social workers, and counselors, who are attuned to the needs of college students. I strongly encourage you to take advantage of this valuable resource. To connect with Counseling Center services, please visit 211 & 214 Wilder Tower, or call 901.678.2068. To know more about their services, you can visit their website at <https://www.memphis.edu/counseling>. In a crisis situation, please call 901.678.HELP (4357) to speak to the On-call counselor. Remember, getting help is an intelligent and courageous thing to do -- for yourself and for those who care about you.

## **11 Personal or Academic Challenges including Food & Housing Insecurity**

If you are experiencing personal or academic challenges including, but not limited to food or housing issues, family needs, or other stressors, please visit the [Dean of Students Office](#) to learn about resources that can help. Any student who faces personal challenges including, but not limited to securing their food or housing and believes this may affect their performance in the course is urged to contact the [Dean of Students Office](#) at 901.678.2187 located in the University Center, Suite 359 for assistance. If you are comfortable doing so, please also let the instructor

know you are experiencing challenges as they may be able to assist you in connecting with campus or community supports.

## **12 Personal Relationships**

There are special problems in any personal relationship between individuals where one party possesses direct academic, administrative, supervisory, evaluative, counseling or extracurricular authority over the other party. Such positions include, but are not limited to, teacher and student or assistant, supervisor and employee, senior faculty and junior faculty, mentor and trainee, advisor and advisee, counselor and client, teaching assistant and student, coach and athlete, and the individuals who supervise the day-to-day student living environment and student residents.

In accordance with [UofM Policy HR5050](#), no University employee shall enter into or maintain any personal relationships with students or with employees over whom they exercise or, reasonably can expect to exercise, direct or indirect control in areas such as academics, administration, supervision, evaluation, counseling or extracurricular authority or influence. No University employee shall exercise any direct or indirect control in the areas of academics, administration, supervision, evaluation, counseling or extracurricular authority over any student or employee with whom that employee had previously been involved in a personal relationship.

Any employee, including faculty, who is currently in a personal relationship or becomes involved in a personal relationship that might be covered by terms of this policy, must disclose the relationship immediately to Human Resources-Employee Relations and Engagement so that any and all steps are taken to comply with this policy.