



## **CIS 375 Section 001 and 002**

### **Software Engineering 1**

#### **4 Credit Hours, Fall 2021**

6:00-7:45 TTh, Recitation, in-person and on-line

#### **Contact Information:**

- Professor Bruce R. Maxim
  - Office Hours: 3-5 T W Th by appt.
  - Email: bmaxim@umich.edu
  - Office Location: 233 CIS
  - Phone Number: 313-436-9155
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#### **Course Description:**

This course presents an in-depth treatment of the following software engineering topics: software engineering paradigms, requirements, specification, functional design, object-oriented design, user interface design, software verification and validation, and the maintenance and management of software engineering artifacts, as well as an introductory discussion of software reliability. Various phases of the software engineering process will be modeled using UML.

#### **Learning Goals:**

Dearborn Discovery Core Category and Goals: Upper Level Writing

- Students are able to demonstrate advanced competency by writing for a specific audience and integrating disciplinary ideas and concepts (requirements document).
- Students are able to effectively evaluate and use research methods, sources, or technology appropriate to the field (design document).
- Students are able to engage in critical inquiry and thinking to synthesize or create a new rendering of perspective (milestone documents in the term project).

Program Learning Goals:

- Our graduates will be successfully employed in a computer and information science-related field or another career path, in an industrial, commercial, academic, governmental, or non-governmental organization, or will be a successful graduate student in a program preparing them for such employment
- Our graduates will lead and participate in culturally diverse teams, becoming global collaborators and adapting to an ever-changing field
- Our graduates will continue their professional development by obtaining continuing education credits, professional registration or certifications, or post-graduate study credits or degrees

Course Objectives:

a. instructional objectives

- The student will be able to create a risk table for a software development project and risk information sheets for each critical or catastrophic risk
- The student will be able to create and execute a test plan for a software system, including test case creation, based on the specified requirements
- The student will be able to implement a software system that meets the needs of an external customer and that involves the creation of a significant user interface and help system
- The student will be able to make use of appropriate software engineering tools in the development of a software product
- The student will be able to manage the completion of a software project for an external customer
- The student will be able to participate in several peer design walkthroughs, including the presentation and critiquing of each other's designs during class time
- The student will be able to participate on a multi-disciplinary design team to design and implement a software project
- The student will be able to write a complete design document for a software system
- The student will be able to write a management plan for a software project that involves time and resource estimates, personnel scheduling detail, and the determination of its production costs

b. Student outcomes addressed in the course

- Outcome (1) – Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
- Outcome (2) – Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program's discipline.
- Outcome (3) – Communicate effectively in a variety of professional contexts.
- Outcome (4) – Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
- Outcome (5) – Function effectively as a member or leader of a team engaged in activities appropriate to the program's discipline.
- Outcome (6) – Apply computer science theory and software development fundamentals to produce computing-based solutions.

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**Required Materials and/or Technology:**

- **REQUIRED:** R.S. Pressman and B. Maxim, Software Engineering: A Practitioner's Approach, 9th Edition, McGraw Hill, 2020.
- **RECOMMENDED:** S.R. Schach, Object-Oriented and Classical Software Engineering, 8th Edition, McGraw-Hill, 2011

- **TECHNOLOGY:** Various programming languages, Zoom, and software engineering tools.
- **URL:** <http://www-personal.umd.umich.edu/~bmaxim/>  
<http://groups.umd.umich.edu/cis/course.des/cis375.html>

### Assignments and Grading Distributions:

|                                 |     |
|---------------------------------|-----|
| 16 of 18 Reading Reflections    | 20% |
| 5 Project Assignments           | 60% |
| 20 of 22 Laboratory Assignments | 20% |

|         |           |        |           |        |           |
|---------|-----------|--------|-----------|--------|-----------|
| 97-100% | <b>A+</b> | 84-86% | <b>B</b>  | 70-73% | <b>C-</b> |
| 94-96%  | <b>A</b>  | 80-83% | <b>B-</b> | 67-69% | <b>D+</b> |
| 90-93%  | <b>A-</b> | 77-79% | <b>C+</b> | 64-66% | <b>D</b>  |
| 87-89%  | <b>B+</b> | 74-76% | <b>C</b>  | 60-63% | <b>D-</b> |

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### Tentative Course Outline and Schedule:

| Module | Date                 | Activity, Content, Assignments   |
|--------|----------------------|--|
| 1      | Sep 02               | Course Introduction<br>Software and Software Engineering - SEPA 1<br><br>Pretest (Canvas)  |
| 2      | Sep 07<br><br>Sep 09 | Software Process Models<br>Paper Tower, Airplane Challenge - SEPA Chap 2<br><br>Agile Process Models<br>SCRUM Game - SEPA Chap 3   |
| 3      | Sep 14<br><br>Sep 16 | Requirements Engineering 1<br>Understanding Requirements and Ambiguity - SEPA Chap 4<br><br>Requirements Engineering 2<br>User Stories, Use Cases - SEPA Chap 6, SEPA Chap 7 |

|    | <b>Date</b> | <b>Activity, Content, Assignments</b>  |
|----|-------------|--|
| 4  | Sep 21      | Requirements Modeling 1<br>CRC/UML - SEPA Chap 8                                     |
|    | Sep 23      | Requirements Modeling 2<br>UML - SEPA Chap 8, SEPA App 1                             |
| 5  | Sep 28      | Reviews<br>SEPA Chap 16  |
|    | Sep 30      | Inspections<br>SEPA Chap 16  |
| 6  | Oct 05      | PMP 1<br>Project Estimation – SEPA Chap24, SEPA Chap 25                              |
|    | Oct 07      | PMP 2<br>Project Scheduling - SEPA Chap 25   |
| 7  | Oct 12      | RISK Management and Software Metrics<br>SEPA Chap 23, SEPA Chap 26                   |
|    | Oct 14      | Team Presentations<br>OOA SRS Videos Due   |
| 8  | Oct 19      | Architectural Design and Component Design<br>SEPA Chap 9, SEPA Chap 10, SEPA Chap 11 |
|    | Oct 21      | Configuration Management and Support<br>SEPA Chap 22, SEPA Chap 27                   |
| 9  | Oct 26      | Team Presentations<br>Project Plan Videos Due  |
|    | Oct 28      | UX Design 1<br>User Interface Design and Reviews SEPA - Chap 12                      |
| 10 | Nov 02      | UX Design 2<br>Patterns, Personas, Customer Journeys - SEPA Chap 12, SEPA Chap 14    |
|    | Nov 04      | UX Design 3<br>Paper Prototypes and User Modeling - SEPA Chap 13                     |
| 11 | Nov 09      | Software Quality<br>Defect Life Cycle - SEPA8 Chap 15, SEPA8 Chap 17                 |
|    | Nov 11      | Technical Reviews<br>Design Document Videos Due                                      |

|    | <b>Date</b>        | <b>Activity, Content, Assignments</b>                              |
|----|--------------------|--|
| 12 | Nov 16             | Testing 1<br>Understanding Testing – SEPA Chap 19, SEPA Chap 20    |
|    | Nov 18             | Testing 2<br>Test Case and Test Plans – SEPA Chap 19, SEPA Chap 20 |
|    | Nov 20 -<br>Nov 28 | Thanksgiving Vacation  |
| 13 | Nov 30             | Testing 3<br>Cost Effective Testing – SEPA19                       |
|    | Dec 02             | Testing 4<br>Usability/Accessibility - SEPA Chap 21                |
| 14 | Dec 07             | Secure Software Engineering<br>SEPA Chap 18                        |
|    | Dec 09             | Technical Reviews<br>Test Plan Videos Due                          |
|    | Dec 12             | Study Day  |
|    | Dec 16?            | Final Project Demo Videos Due                                      |

### **Course and University Policies:**

#### **Instructor or Course Specific Policies:**

A student enrolled in a course (lecture, laboratory, recitation, colloquium, seminar, or other university approved format) is expected to participate every scheduled session of the course. The instructor of each course will make known to the students the course attendance policy with respect to student absences. It is the student's responsibility to be aware of this policy. The instructor makes the final decision to excuse or not to excuse an absence.

Presence or participation is also expected in online courses. Participation in online courses can take various forms; it is the instructor who determines what form of presence or participation is expected. Students enrolled in online courses are responsible for being aware of that policy/expectation. An instructor is entitled to give a failing grade for excessive absences or for a student who stops participating in class at some point during the semester.

The Faculty of the University of Michigan - Dearborn, College of Engineering and Computer Science (CECS) believe that our students are honorable, ethical, trustworthy people. Students who engage in cheating of any kind, place the academic integrity and reputation of our university and our college in jeopardy.

To ensure that all CECS students receive an equitable education and are prepared for the workforce, the [University of Michigan - Dearborn Academic Code of Conduct](#) will be strictly enforced in all CECS courses. All CECS students are required to read, understand, and follow the Academic Code of Conduct, as well as any additional rules that the course instructor provides. Students who violate the Academic Code of Conduct or course rules, are subject to all penalties indicated, including failing the course, potential loss of scholarship funds or expulsion from the university.

**Cheating includes, but is not limited to:**

- Receiving assistance of any kind, on any individual, graded assignment or exam
- Providing assistance of any kind, on an individual, graded assignment or exam
- Using materials that are prohibited on any graded assignment or exam
- Test/Exam Parties - i.e., completing an individual exam as a group project
- Collusion/Deception of any kind, including but not limited to:
  - coordinating with others to obtain or distribute prohibited or unpublished materials
  - giving false information to receive time extensions or re-takes
  - obtaining and using previous exams not provided by the instructor
- Using a mobile device (including smart watches) to communicate with others during an exam
- Paying another person to complete coursework, including exams
- Receiving payment to complete another student's work, including exams
- Requesting and using help from Chegg, Course Hero or any other such service
- Submitting examination information to Chegg, Course Hero or any other such service
- Plagiarism - using another person's work without properly citing
- Storing equations or solutions in a calculator to use on a quiz or exam when not permitted
- Screenshots of Canvas quizzes or exams
- Any "hacks" used to access Canvas content or other materials before released
- Any other dishonest action that violates course rules and/or the Academic Code of Conduct

If you are questioning an action you are about to take and cannot reach your instructor to verify, it is likely that you should not proceed with that action. Oral exams may be given to determine if a student understands the course material.

Course lectures may be audio/video recorded and made available to other students in this course. As part of your participation in this course, you may be recorded. If you do not wish to be recorded, please contact [bmaxim@umihc.edu](mailto:bmaxim@umihc.edu) the first week of class (or as soon as you enroll in the course, whichever is latest) to discuss alternative arrangements.

## Face Mask Policy

Face coverings are required inside all UM-Dearborn buildings (especially in laboratory and classroom spaces) and on campus transportation for all faculty, staff, students and guests. Face coverings may be removed when actively eating or drinking or when in an office by yourself with the door closed. The University will provide face coverings to any student, faculty, or staff member upon request.

Anyone attending class in person without a proper and visible face covering will be asked to put one on or leave. Instructors will end class if anyone present refuses to appropriately wear a mask for the duration of class. Students should also be sure they are situated at least six feet away from anyone in the class and located in a seat designated to ensure that distance.

Students who refuse to wear face coverings or appropriately adhere to other stated requirements may face disciplinary action under the [Disruptive Student Behavior policy](#). Students may contact [Disability Services](#) to determine if an accommodation is reasonable under the Americans with Disabilities Act.

## Library Resources

The library's here to help! Go to the Mardigian Library website at [library.umd.umich.edu](http://library.umd.umich.edu) for information about accessing research help, accessing the library's [online databases](#), [journal articles](#), and [books/ebooks](#), and checking out physical items from the library. Research librarians will be available to help you with your research needs through [live chat](#), [text](#), [email](#), and [virtual appointments](#), as well as in the library for walk-in help. Check-out for [books](#), [course reserves](#), and [loanable technology \(such as Chromebooks\)](#) is also available at the Library Info Desk. For any of your questions, feel free to ask the Mardigian at [library.umd.umich.edu/ask](http://library.umd.umich.edu/ask).

## Food Pantry

The pantry exists to support individuals on their journey as they work toward achieving their goals. We are committed to increasing access to food as a key to success, by assisting any student in need! If you need access or have questions, please contact the Office of Student Life by phone at 313-593-5390, by email at [umdearbornpantry@umich.edu](mailto:umdearbornpantry@umich.edu).

## University-Wide Policies or Statements Relevant to Courses:

Please see the 'Course Policies' Menu on Canvas for information on the following:

- University Attendance Policy
- Academic Integrity Policy
- Counseling
- Disabilities Services
- Safety Statement
- Harassment, Sexual Violence, Bias, and Discrimination