

# University of Michigan-Dearborn Syllabus



## CIS 375 Software Engineering 1 - 4 credit hours

Semester and Year: Fall 2016

Prof. Bruce R. Maxim

Office Location: 233 CIS

Phone Number: (313) 436-9155

E-Mail: [bmaxim@umich.edu](mailto:bmaxim@umich.edu)

Office Hours: 4:00-6:00 T, 4:00-6:00 W, 4:00-6:00 Th, by appt. F

Dearborn Discovery Core Category or Categories: Upper Level Writing

Course Meeting Times and Format(s): 1087 CASL, 6-7:45 TR, Recitation

URL: <http://www-personal.umd.umich.edu/~bmaxim/>

<http://www.umd.umich.edu/CIS/course.des/cis375.html>

### 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.

### Program 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

### Dearborn Discovery Core Goals:

- 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).

## 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 (ABET)

- Outcome b – An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution
- Outcome c – An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs
- Outcome d – An ability to function effectively on teams to accomplish a common goal
- Outcome e – An understanding of professional, ethical, legal, security, and social issues and responsibilities
- Outcome f – An ability to communicate effectively with a range of audiences
- Outcome g – An ability to analyze the local and global impact of computing on individuals, organizations and society
- Outcome i – An ability to use current techniques, skills, and tools necessary for computing practices
- Outcome k – An ability to apply design and development principles in the construction of software systems of varying complexity

**Required Materials and/or Technology:**

REQUIRED: Software Engineering: A Practitioners Approach, 8th Edition, Roger S. Pressman and Bruce R. Maxim, McGraw-Hill, 2014.

RECOMMENDED: Classical and Object-Oriented Software Engineering, 8th Edition, Stephen R. Schach, McGraw-Hill, 2011.

TECHNOLOGY: Various programming languages and software engineering tools.

**Assignment and Grading Distribution:**

|                       |                  |     |
|-----------------------|------------------|-----|
| 2 Exams               | (50 points each) | 20% |
| 4 Project Assignments | (50 points each) | 75% |
| Class Participation   |                  | 5%  |

**Grading Scale:**

|           |    |         |    |
|-----------|----|---------|----|
| 96%- 100% | A+ | 77%-79% | C+ |
| 92%- 95%  | A  | 74%-76% | C  |
| 90%- 91%  | A- | 70%-73% | C- |
| 87%- 89%  | B+ | 67%-69% | D+ |
| 84%- 86%  | B  | 64%-66% | D  |
| 80%- 83%  | B- | 60%-63% | D- |

**Tentative Course Outline:**

| Date   | Activity and Content   | Reading   |
|--------|--|-----------|
| Sep 8  | Software Engineering and Process Models<br>Paper Tower, Airplane     | SEPA 1-4  |
| Sep 13 | Agile Process Models<br>SCRUM Card Game                              | SEPA 5-6  |
| Sep 15 | Requirements Engineering<br>Understanding Requirements and Ambiguity | SEPA 7-8  |
| Sep 20 | Requirements Engineering<br>User Stories                             |           |
| Sep 22 | Requirements Engineering<br>Use Cases                                | SEPA 9-11 |
| Sep 27 | Requirements Modeling<br>UML   | SEPA App1 |
| Sep 29 | Reviews  | SEPA 20   |
| Oct 04 | Inspections  |           |

|        |  |                        |
|--------|--|------------------------|
| Oct 06 | Configuration Management   | SEPA 29                |
| Oct 11 | Project Estimation<br>OOA project due                            | SEPA 31,33             |
| Oct 13 | Exam 1   |                        |
| Oct 18 | Fall Break   |                        |
| Oct 20 | Project Management<br>Scheduling                                 | SEPA 34                |
| Oct 25 | Risk Management<br>Product and Process Metrics                   | SEPA 35<br>SEPA 30, 32 |
| Oct 27 | Architectural Design<br>Component Design                         | SEPA 12, 13<br>SEPA 14 |
| Nov 1  | Team Presentations<br>Project Plan Due                           |                        |
| Nov 3  | User Interface Design and Reviews<br>(1212 ML)                   | SEPA 15                |
| Nov 8  | Paper Prototypes and User Modeling<br>(1212 ML)                  |                        |
| Nov 10 | Design Patterns  | SEPA 16                |
| Nov 15 | Technical Reviews<br>Design Document Due                         |                        |
| Nov 17 | Software Quality - Defect Life Cycle<br>(1212 ML)                | SEPA 19                |
| Nov 22 | Software Testing Strategies - Understanding Testing<br>(1212 ML) | SEPA 22                |
| Nov 24 | Thanksgiving Break   |                        |
| Nov 29 | Testing Software - Test Cases and Plans<br>(1212 ML)             | SEPA 23                |
| Dec 1  | Testing - Cost Effective Testing<br>(1212 ML)                    | SEPA 24                |
| Dec 6  | Software Quality Assurance - Security Inspection<br>(1212 ML)    | SEPA 21                |
| Dec 8  | Technical Reviews<br>Test Plan due                               |                        |
| Dec 13 | <b>Exam 2</b>  |                        |
| Dec 20 | Oral Presentation of Term Project                                |                        |

**University Attendance Policy:**

A student is expected to attend every class and laboratory for which he or she has registered. Each instructor may make known to the student his or her policy with respect to absences in the course. 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. An instructor is entitled to give a failing grade (E) for excessive absences or an Unofficial Drop (UE) for a student who stops attending class at some point during the semester.

**Academic Integrity Policy:**

The University of Michigan-Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct as set forth by the Code of Academic Conduct (<http://umdearborn.edu/697817/>), as well as policies established by each college. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses and violations can result in penalties up to and including expulsion from the University.

**Disability Statement:**

The University will make reasonable accommodations for persons with documented disabilities. Students need to register with Counseling & Disability Services (DS) every semester they are enrolled. DS is located in 2157 UC ([http://www.umd.umich.edu/cs\\_disability/](http://www.umd.umich.edu/cs_disability/)). To be assured of having services when they are needed, students should register no later than the end of the add/drop deadline of each term. If you have a disability that necessitates an accommodation or adjustment to the academic requirements stated in this syllabus, you must register with DS as described above and notify your professor.

**Safety:**

All students are encouraged to program 911 and UM-Dearborn's University Police phone number (313) 593-5333 into personal cell phones. In case of emergency, first dial 911 and then if the situation allows call University Police.

The Emergency Alert Notification (EAN) system is the official process for notifying the campus community for emergency events. All students are strongly encouraged to register in the campus EAN, for communications during an emergency. The following link includes information on registering as well as safety and emergency procedures information: <http://umdearborn.edu/emergencyalert/>.

If you hear a fire alarm, class will be immediately suspended, and you must evacuate the building by using the nearest exit. Please proceed outdoors to the assembly area and away from

the building. Do not use elevators. It is highly recommended that you do not head to your vehicle or leave campus since it is necessary to account for all persons and to ensure that first responders can access the campus.

If the class is notified of a shelter-in-place requirement for a tornado warning or severe weather warning, your instructor will suspend class and shelter the class in the lowest level of this building away from windows and doors.

If notified of an active threat (shooter) you will Run (get out), Hide (find a safe place to stay) or Fight (with anything available). Your response will be dictated by the specific circumstances of the encounter.