

# University of Michigan-Dearborn Syllabus

## CIS 4951/4961 Senior Design 1 - 2 credit hours

Semester and Year: Winter 2017

Prof. Bruce R. Maxim

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Office Hours: 4:00-6:00 M, 4:00-6:00 W, 2:00-4:00 Th, by appt. F

Dearborn Discovery Core Category or Categories:

Capstone Experience, Creative and Critical Thinking

Course Meeting Times and Format(s): 12:00-1:45 W, Seminar, 1330 PEC

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

<http://groups.engin.umd.umich.edu/CIS/course.des/cis4951.html>



### Course Description:

This course deals with Advanced Software Engineering Principles and Professional Practice Issues. The purpose behind this course is to give CIS students the opportunity to sharpen their software analysis and client communications skills. Students will work with real-world clients and take software project from the requirements analysis phase through the implementation and delivery of the product to the customer's site (prior to the end of the next semester).

Classroom activities focus on student directed discussions of current profession issues and presentations based on project milestones from the software development activities. This course is an 8 month capstone experience. You must take CIS 4952/4962 in Summer 2017.

### 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:

- a. Capstone Experience
  - Students are able to identify, obtain, research, and describe major issues associated with a specific topic of inquiry.

- Students are able to identify and discuss critical questions leading to a deeper engagement in the study of a specific topic of inquiry or technology.
  - Students are able to apply knowledge, skills and abilities in the creation and execution of a concrete project informed by specific topic of inquiry.
- b. Critical and Creative Thinking
- Students are able to identify, summarize, and understand the problem, question, and/or issue.
  - Students are able to identify, locate, and critically or creatively evaluate evidence using appropriate sources or technology.
  - Students are able to consider and interpret alternative perspectives to support analysis.
  - Students are able to develop and communicate conclusions and implications by synthesizing technical, aesthetic, conceptual knowledge or supporting evidence.

### **Course Objectives:**

- a. Outcomes of instruction
- The student will be able to conduct one 30 minute seminar discussions of ethics or professional issues papers requiring independent library and/or Internet research
  - The student will be able to create a risk monitoring, mitigation, and management plan for a real-world software development project
  - The student will be able to create and execute a software quality assurance plan for a real-world software project
  - The student will be able to describe the design trade-offs considered in formulating the analysis model for a software system intended to meet the needs of a real-world client
  - The student will be able to make 5 group PowerPoint presentations, each about 15-20 minutes in length
  - The student will be able to write 3 milestone documents (about 40 pages each)
  - 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
  - The student will be able to write a software quality management plan for a software project.
  - The student will be able to write a specification document for a software system, including detailed requirements and a complete analysis model, based on the needs of a real-world customer
- b. Student outcomes addressed in the course
- Outcome b – An ability to analyze a problem, and identify and define the computing

- requirements appropriate to its solution (Not assessed here)
- Outcome c – An ability to design, implement and evaluate a computer-based system, process, component, or program to meet desired needs (Not assessed here)
  - Outcome d – An ability to function effectively on teams to accomplish a common goal (Assessed here)
  - Outcome e – An understanding of professional, ethical, legal, security, and social issues and responsibilities (Assessed here)
  - 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 (Assessed here)
  - Outcome h – Recognition of the need for, and an ability to engage in, continuing professional development (Assessed here)
  - Outcome i – An ability to use current techniques, skills, and tools necessary for computing practices (Not assessed here)
  - Outcome j – An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices (Not assessed here)

**Required Materials and/or Technology:**

REQUIRED: Ethics for the Information Age, 7th Edition, M. Quinn, Pearson, 2017.

RECOMMENDED: Software Engineering: A Practitioners Approach, 8<sup>th</sup> Edition, Roger S. Pressman and Bruce R. Maxim, McGraw-Hill, 2014.

TECHNOLOGY: Various programming languages and software engineering tools.

**Assignment and Grading Distribution:**

4 Project Assignments (Written and Oral)	60%
Paper Presentation	20%
Working Prototype	10%
Attendance	10%

**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
Jan 11	Client Presentations
Jan 18	Client Presentations
Jan 25	Project Teams Formed
Feb 1	Paper Presentations
Feb 8	Paper Presentations
Feb 15	Use Case Presentations
Feb 22	Paper Presentations
Mar 1	Spring Break
Mar 8	Project Management Plan Presentations
Mar 15	Paper Presentations
Mar 22	Specification Document Presentations
Mar 29	Specification Document Presentations
Apr 5	Paper Presentations
Apr 12	Paper Presentations
Apr 19	SQA Plan Presentations
Apr 21	CECS Senior Design Day 1:00-3:00
Apr 26	Post Mortem and Feasibility Prototype 11:30-2:30

**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.