

CIS 4951/4961 Senior Design 1 - 2 credit hours

Prof. Bruce R. Maxim

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Office Hours: 2:00-3:00 and 4:30-6 MW, by appt. F

Dearborn Discovery Core Category or Categories: Capstone Experience,
Creative and Critical Thinking

Course Meeting Times and Format(s): 12:00-2:00 M, Seminar, 175 ELB

URL: <http://www.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 Fall 2015.

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

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 management plan for a software project that involves time and resource estimate, personnel scheduling detail, and the determination of its production costs
- 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)

c. 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.

d. 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.

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. If you miss a class discussion you will be required to do additional written work to make up your absence.

Academic Integrity

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://www.umd.umich.edu/policies_st-rights/), as well as policies established by each college. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses, and may be monitored using tools including but not limited to TurnItIn. Violations can result in penalties up to and including expulsion from the University. At the instructor's discretion, the penalty may be a grade of zero on the assignment up to and including recommending that the student be expelled from the University. It is the sole responsibility of the student to understand and follow academic guidelines regarding plagiarism. The University of Michigan-Dearborn has an online academic integrity tutorial that can be accessed at <http://webapps.umd.umich.edu/aim>.

Disability Statement

The University will make reasonable accommodations for persons with documented

disabilities. Students need to register with Disability Resource Services (DRS) every semester they are enrolled for classes. DRS is located in Counseling & Support Services, 2157 UC. 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. Visit the DRS website at: http://www.umd.umich.edu/cs_disability/. If you have a disability that necessitates an accommodation or adjustment to the academic requirements stated in this syllabus, you must register with DRS as described above and notify your professor. Upon receipt of your written notification, we will make accommodations as directed by DRS.

Safety

All students are strongly encouraged to register in the campus Emergency Alert System, used to communicate with the campus community during an emergency. More information on the system and how it works, along with enrollment information can be found at: <http://umemergencyalert.umd.umich.edu/> Please note that the system will only communicate through UM-Dearborn email accounts, so if you primarily use a non-university account you should forward your UM-Dearborn email to your primary account.

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

Students are encouraged to identify two ways out of the building as well as to locate the building's designated assembly area where students are expected to go in the event of an evacuation: http://www.umd.umich.edu/fileadmin/env-health-safety/public/files/Site_Assm_Areas_2011.pdf. For those students requiring assistance in an evacuation, please visit the following site to identify the nearest "Area of Rescue Assistance": http://www.umd.umich.edu/fileadmin/env-health-safety/public/files/Handicap_Accessible_Locations.pdf Please also familiarize yourself with the locations in this building identified as shelter areas in the event of severe weather. Specific shelter locations for severe weather incidents can be located at: <http://www.umd.umich.edu/691921/>

In the case of an active shooter we will shelter in place. If this becomes a necessity please:

- Contact 911 immediately to report an emergency.
- Find a safe area such as small rooms, under furniture, or other safe areas.
- Lock or block doors in rooms where you and others are located.
- For interior rooms, close blinds, shut off lights. Rooms facing outside - have blinds open!
- Get down – preferably under tables, furniture or equipment. Stay away from the door.

- Remain silent (silence all personal communication devices) and stay in place.
- If you are grouped in an area with other people, quietly select a leader.
- The leader should call 911 to report information such as number of people and location.
- Attempt to maintain a calm quiet atmosphere.
- Stay sheltered until you receive an “all clear” message from law enforcement.
- Follow law enforcement direction.

Required Materials and/or Technology:

REQUIRED: Ethics for the Information Age, 6th Edition, M. Quinn, Pearson, 2014.

RECOMMENDED: Software Engineering: A Practitioners Approach, 8th 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-

Course Outline:

Date	Activity and Content
May 4	Course Introduction
May 11	Computing Ethics and Social Computing
May 18	Project Teams Formed
May 25	Memorial Day Holiday

Jun 1	Use Case Presentation
Jun 8	Paper Presentations
Jun 15	Paper Presentations
Jun 22	Project Management Plan Presentation
Jun 29	Project teams check in
Jul 6	Paper Presentations
Jul 13	Paper Presentations
Jul 20	Specification Document Presentation
Jul 27	Paper Presentations
Aug 3	Paper Presentations
Aug 10	SQA Plan Presentation
Aug 21	Post Mortem and Feasibility Prototype 11:30-2:30