Fall Semester 2013

CS 397/8

Software Systems Development

Lectures:

TR 3:30 - 4:45 pm.
Room CS204

Website:

http://web.mst.edu/~ricardom/cs397-F13

Instructor:

Dr. A. Ricardo Morales	Computer Science Building Rm 324 Phone: (573) 341-6353 Fax: (573) 341-4501 Email: ricardom@mst.edu URL: http://www.mst.edu/~ricardom

Office Hours:

MW 3:30 - 5:00 P.M. CS-212 (Computer Lab)

References:

Pressman Roger S, “Software Engineering: A Practitioner's Approach”, 7th Edition, McGraw-Hill, 2010. ISBN-13: 978-0073375977

Ivar Jacobson, Grady Booch, James Rumbaugh, “The Unified Software Development Process”, Addison- Wesley, 1999. ISBN-13: 978-0201571691

Prerequisites:

CS 206 and 100 credit hours completed.

Course Objective and Topics:

This course serves both as a summary of the software development, computer science, and software engineering training you have received at MS&T, as well as a preview and preparation to the manner of software development you are likely to encounter when you embark on your working career as a software professional. It will prepare you for

the tasks you will face in the working environment when engaged in software development. You will study and use key activities throughout the software development lifecycle, from eliciting and analyzing customer requirements, formulating and executing project plans, designing and implementing a solution, testing the developed product, and delivering it to the customer. In performing these software engineering activities, you will have an opportunity to leverage the computer science skills as well as the soft skills acquired during your training here.
Please note that this class, due to its nature as the capstone course for the CS curriculum, involves less structured classroom time as typical.

Main Objectives:

This course combination exists to integrate and exercise the skills that a MS&T Computer Science student has developed during his or her schooling. It has dual objectives. First, it seeks to create a “real world” experience for students. Second, it serves as one of the communication intensive courses required for your degree program. This has several implications:

Professional-Level Experience

The heart of this class is our structure as a corporation. This requires participation in teamwork to organize and coordinate work in order to fulfill the needs of a real customer. Ultimately, the goal of cs397/8 is to have each student recognize the importance of each of his or her classes, provide an accurate glimpse of the post-graduation world, and prepare for it. As a background, the student should have a Computer Science undergraduate coursework background obtained by the finish of their junior year. It is up to the student project groups to ascertain which tools, software, and programming languages are relevant to produce the specified design goals within a semester’s time-frame. This is the real world. You are expected to draw upon your background and abilities to carry out the work.

Communication Emphasis

MS&T requires each degree program to have classes that emphasize communication skills. One challenge to this is that our two objectives are now competing with each other: emphasize teamwork, while the communication emphasis requires individual grading. As much as possible, the instructor will attempt to manage the situation in a manner consistent with corporate practices, such as activity reports.

Class Structure:

This course proceeds primarily through experiential learning. You will participate in a significant software development project to refresh and demonstrate your computer science and software engineering skills.

The class will operate as if a small startup company. The story line goes roughly as

follows:

- You are a group of software engineers who have joined together to develop a software product.
- You have different skills and backgrounds, but together, you hope to succeed in bringing an exciting product to market. As a team, you select the product you will build.
- Your job is to define the software product you want to develop and run through the full development life-cycle to deliver the finished and tested product to the venture capitalist, satisfying the requirements that you established and the features you described in your product vision.

This story is taken from real life; in fact, you may find yourself in this situation one day. Even if not in a startup company, work as part of a development team of a larger company will be very similar.

Class, of course, is a little different from this story. The overall hierarchy is designed to resemble a pyramid.

1. 1. Chairman (1 Professor)
   - Dr. Ricardo Morales
2. Team Leads (~5 Students)
3. Developers (~21 Students)

As you probably guessed, I will play the role of the chairman. However, I have no funds to give you; the experience and the course credits gained are all the rewards offered. To motivate you, I cannot promise you raises or threaten to lay you off. Hopefully you will feel motivated nevertheless and work hard, as your success and the success of your team will depend on it.

While I will remain off-hand with respect to managing your project to make your learning experience more realistic, I will be available as a teacher to you at all times.

Project Roles:

Role	*Name*	*Responsibilities*
Chairman	Ricardo Morales	• Provide feedback on the proposed product offering suggestions as to adequacy of proposed feature set. • Provide feedback on project artifacts. Either accept of reject an artifact. (If rejected, an artifact should be reworked)

Team lead	<Student> (one per project)	• Plans the technical approach to develop the assigned feature. • Decomposes feature into individual project tasks. • Coordinates and leads the developers working on assigned features. • Reviewing the monthly report activity. • Represents the team on weekly review • meetings.
Developer	<Student>	• Develop and design project artifacts. • Implement assigned features / tasks

For each project, a student will be selected to serve as the team lead. Typically, that student will have strong technical expertise pertaining to that project. The team lead serves in this role until the completion of the project.

Evaluation Criteria:

(1) Project:
Each group should be composed by four or five students. Each group proposes his own project. It possible that a group proposes a list of projects/ideas and the chairman (instructor) will help you to choose the best one based on his experience. In addition to the two presentations described previously, the project includes the following steps:

1. Provide individual **resumes** to the chairman
2. **Project Proposal**: up to four pages describing the proposed project.
3. **Project requirements**: Develop product charter, interviews, describe high-level features, Develop use case specification and scenarios (use-case).
4. **Project Planning**: Develop work breakdown structure
5. **Project Design**: Describe and provide class diagrams.
6. **Coding and Testing**: tool demonstrations, and unit tests.

(2) Monthly Reports:
In the workplace, it is one thing to know how your work is progressing; it is another for your boss and peers to know. Monthly reports are just that, a report on the work completed that month. The content of the report largely depends on what role the student is playing. Separate report specifications and expectations will be provided in a separate document during the first lecture. Team leaders are the individuals trusted with delivering a report at the end of the month.

(3) Presentations:
During the course of the project, there will be two meetings where the team will present the design and status of various features in class. These meetings serve both to communicate design and status of the feature to the rest of the team as well as to

provide you with the opportunity to gain familiarity with project presentations. The first presentation will be in the mid-semester. During this meeting each team is expected to present: work breakdown structure, use case specification and scenarios (use case and sequence diagrams), and software architecture (UML class diagrams). The second presentation will be in the end of the semester where each team is expected to present: coding, unit tests, tool demonstration, and future extensions.

Assessment:

The grading for the class will be as follows:

- Project *65%*
  - Resume and Cover Letter *5% (graded individually)*
  - Project proposal *5%*
  - Requirements Analysis *15%*
  - Planning *10%*
  - Project Design *15%*
  - Coding and Testing *15%*

- Monthly Reports: *15% (graded individually, 3 reports, 5% each)*

- Presentations *20% (graded individually)*
  - Mid-Semester *10%*
  - End-of-Semester *10%*

Assignments are due on the day assigned and for each business day late, 20% of the value will be deduced from the homework grade. No assignments will be accepted or submitted more than one week after the due date.

Grading Scale:

A : [90 - 100]%
B : [80 - 90)%
C : [70 - 80)%,
D : [60 - 70)%,
F : < 60%

Course Policies

I will do my best to address any concerns you have about the class. Please feel free to approach me.
My immediate supervisor is Prof. Clayton Price. If there are any problems that I am unable to resolve for you relevant to this class, address your concerns to Prof. Price. His

office is CS-325 and his e-mail is price@mst.edu.

Makeups:

No makeup homework / tests will be given unless the student contacts the instructor before the exam and has an MS&T-acceptable documented reason (i.e. illness, death in the family, etc).

Academic Alert System:

http://academicalert.mst.edu
All faculty are encouraged to utilize the online Academic Alert System. The purpose of the Academic Alert System is to improve the overall academic success of students by improving communication among students, instructors and advisors; reducing the time required for students to be informed of their academic status; and informing students of actions necessary by them in order to meet the academic requirements in their courses.

Academic Dishonesty:

http://registrar.mst.edu/academicregs/index.html
Page 30 of the Student Academic Regulations handbook describes the student standard of conduct
relative to the System's Collected Rules and Regulations section 200.010, and offers descriptions of academic dishonesty including cheating, plagiarism or sabotage. Additional guidance for faculty, including the University's Academic Dishonesty Procedures, is available online at http://ugs.mst.edu.

Classroom Egress Maps:

http://registrar.mst.edu/links/egress.html
Please familiarize yourselves with the classroom egress maps.

Disability Support Services:

http://dss.mst.edu
Any student inquiring about academic accommodations because of a disability should be referred to Disability Support Services so that appropriate and reasonable accommodative services can be determined and recommended. Disability Support Services is located in 204 Norwood Hall. Their phone number is 341-4211 and their email is dss@mst.edu. Instructors may consider including the following statement on their course syllabus as a means of informing students about the services offered:

"If you have a documented disability and anticipate needing accommodations in this course, you are strongly encouraged to meet with me early in the semester. You will need to request that the Disability Services staff send a letter to me verifying your disability and

specifying the accommodation you will need before I can arrange your accommodation."

If you have any questions about the information listed above, please contact the Office of Undergraduate Studies at 573-341-7276.