Software Systems Development

Lectures:

Time: Tuesdays, Thursdays 3:30 - 4:45 pm.
Room: Toomey 295.

Website:

http://web.mst.edu/~ricardom/cs4096/19.1

Instructor:

Dr. A. Ricardo Morales	Computer Science Building Rm 340 Phone: (573) 341-6353 Fax: (573) 341-4501 Email: ricardom@mst.edu URL: http://www.mst.edu/~ricardom

Office Hours:

Time to Be Announced. CS-212 (Computer Lab)

References:

Pressman Roger S, "*Software Engineering: A Practitioner's Approach*", 8th Edition, McGraw-Hill, 2010. ISBN-13: 978-0078022128

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

Prerequisites:

CS-3100, 100 credit hours completed, and the Ethics Elective.

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 cs4096/7 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 (~6 Students)
3. Developers (~42 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 earned 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.
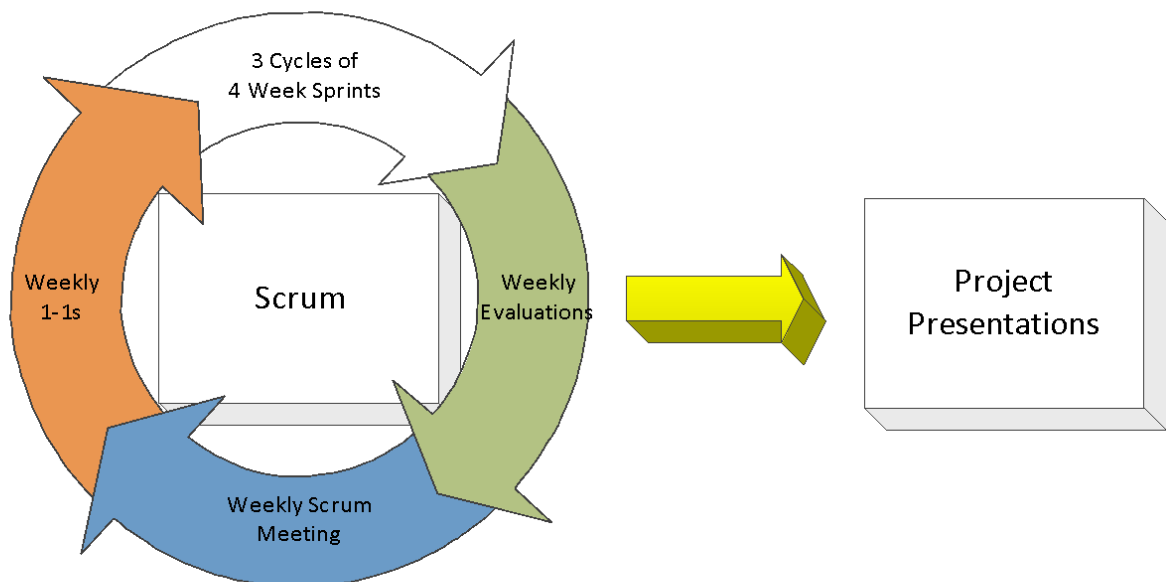
Project Roles:

Role	Name	Responsibilities
Chairman	Ricardo Morales	● Provide feedback on the proposed product offering suggestions as to adequacy of proposed feature set.
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.
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.

Approach:

(Graph by Matt Buechler)

Deliverables:

This course consists mostly of group work. As a team, you will deliver a presentation at the end of each sprint and a report on the ethics, security, legal and social impact of your project. Individually, you will deliver an evaluation survey of your teammates, and an essay in which you reflect on the learning experience provided by this class.

Assessment:

The grading for the class will be as follows:
- Weekly Evaluations   *58%*   (Assessed by scrum activity)
  - Sprint 1 (weeks 2, 3, 4)   *10%*
  - Sprint 2 (weeks 6, 7, 8)   *18%*
  - Sprint 3 (weeks 11, 12, 13, 15) *30%*

- Sprint Evaluations   *30%*   (Assessed by discussions and presentations)
  - Sprint 1 (week 5)   *8%*
  - Sprint 2 (week 10)   *10%*
  - Sprint 3 (week 16)   *12%*

- Reports   *12%*
  - Team Peer Evaluation   4% (*Individual*)
  - Ethics, Security, Legal & Social Impact Report   4%
  - Experiential Learning Reflection Essay   4% (*Individual*)

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 meetings / presentations will be given unless the student contacts the instructor before the day <u>and</u> 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://designconstruction.mst.edu/floorplan/

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.

Title IX:

Missouri University of Science and Technology is committed to the safety and well-being of all members of its community. US Federal Law Title IX states that no member of the university community shall, on the basis of sex, be excluded from participation in, or be denied benefits of, or be subjected to discrimination under any education program or activity. Furthermore, in accordance with Title IX guidelines from the US Office of Civil Rights, Missouri S&T requires that all faculty and staff members report, to the Missouri S&T Title IX Coordinator, any notice of sexual harassment, abuse, and/or violence (including personal relational abuse, relational/domestic violence, and stalking) disclosed through communication including but not limited to direct conversation, email, social media, classroom papers and homework exercises.

Missouri S&T's Title IX Coordinator is interim chief diversity officer Neil Outar. Contact him (naoutar@mst.edu; (573) 341-6038; Temporary Facility A-1200 N. Pine Street) to report Title IX violations. To learn more about Title IX resources and reporting options (confidential and non-confidential) available to Missouri S&T students, staff, and faculty, please visit http://titleix.mst.edu.