COMP SCI 4096/4097
Software Systems Development

Tentative Fall 2019 Syllabus
- Section 101 4096/4097 (70394/70395): TuTh 3:30-4:45, Butler-Carlton 120

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Office Hours: Open Door Policy (Try Tu/Th 2p-3:30p), and also by appointment

Course Outcomes
This course serves both as a summary of the software development, computer science, and software engineering training you have received at MST, 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.

Intended Course Audience/Prerequisites
The intended audience for this course is Computer Science undergraduates who have completed at least 100 credit hours including CS 3100 and an Ethics Elective, with a C or better.

Course Materials
Canvas: The Canvas "Learning Management System" (LMS) will be used to provide information including administration of homework and grades. This can be accessed through http://canvas.mst.edu and additional help can be sought from the IT Helpdesk (http://it.mst.edu/help-desk/) or Ed Tech (https://edtech.mst.edu).

Course Objectives
This course combination exists to integrate and exercise the skills that a MST 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 a corporate-like structure. This requires participation in teamwork to organize and coordinate work in order to fulfill the needs of a real customer. Ultimately, the goal of CS4096/4097 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
MST 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. Along these lines, the teams' projects will be assessed in whole, but the grades will be distributed individually based upon participation and internal team reviewing.

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. Chairman (Professor)
2. Team Leads (One per group)
3. Developers (Remaining 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 hands-off 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:
Chairman
- Provide feedback on the proposed product, offering suggestions as to adequacy of proposed feature set.

Student Team Lead
- Plans the technical approach to develop the assigned features.
- Decomposes features into individual project tasks.
- Coordinates and leads the developers working on assigned features.

Student Developer
- 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 should serve in this role until the completion of the project.

Approach:
(Graph by Matt Buechler)
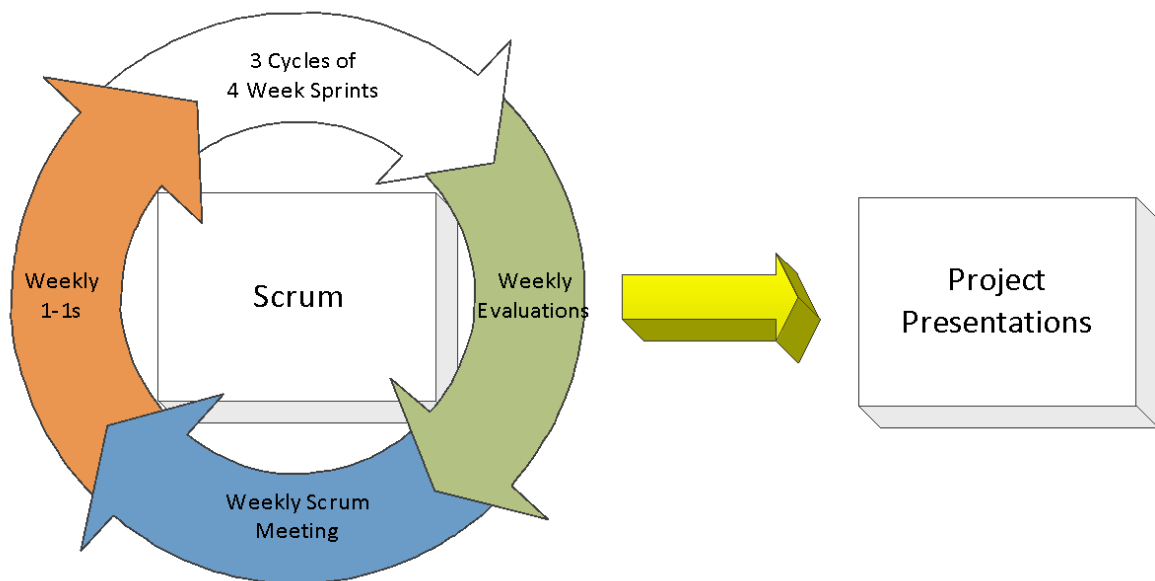
Deliverables:

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 internal evaluation surveys 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 56% (Assessed by scrum activity)
- ○   Sprint 1 (5 at weeks 3, 4)   10%
- ○   Sprint 2 (6 at weeks 7, 5/8, 9)   18%
- ○   Sprint 3 (7 at weeks 12, 13, 14, 15)   28%

- ●   Sprint Evaluations 30% (Assessed by discussions and presentations)
- ○   Sprint 1 (week 6)   8%
- ○   Sprint 2 (week 11)   10%
- ○   Sprint 3 (week 16)   12%

- ●   Reports 14%
- ○   Ethics, Security, Legal & Social Impact Report   4% (Group)
- ○   Experiential Learning Reflection Essay   4% (Individual)
- ○   Team Peer Evaluations   6% (Individual)

Grading Scale: A: 90-100%, B: 80-89%, C: 70-79%, D: 60-69%, F: 0-59%.

Course Policies

- No makeup meetings/presentations will be allowed unless the student contacts the instructor (preferably in advance) with an acceptable reason (illness, family emergency, etc.).

Campus Policies

Accessibility and Accommodations: It is the university's goal that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please contact Disability Support Services at (573) 341-6655, dss@mst.edu, or visit http://dss.mst.edu/ for information, or go to mineraccess.mst.edu to initiate the accommodation process.

> *Please be aware that any accessible tables and chairs in this room should remain available for students who find that standard classroom seating is not usable.*

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. In particular, you must work alone on all tests, exams, and individual programming assignments. Other informational

resources for students regarding ethics and integrity can be found online at http://academicsupport.mst.edu/academicintegrity/studentresources-ai. Additional guidance for faculty, including the University's Academic Dishonesty Procedures, is also available on-line at http://academicsupport.mst.edu.

Academic Assistance: The university provides multiple avenues for additional academic assistance including LEAD and the Student Success Center.

LEAD – The Learning Enhancement Across Disciplines (LEAD) Program sponsors free learning assistance in a wide range of courses for students who wish to increase their understanding, improve their skills, and validate their mastery of concepts and content in order to achieve their full potential. LEAD assistance starts no later than the third week of classes. Check out the online schedule at http://lead.mst.edu/assist, using zoom buttons to enlarge the view. Look to see what courses you are taking have collaborative LEAD learning centers (bottom half of schedule) and/or Individualized LEAD tutoring (top half of the schedule). For more information, contact the LEAD office at 341-7276 or email lead@mst.edu.

Student Success Center – The Burns & McDonnell Student Success Center is a centralized location designed for students to visit and feel comfortable about utilizing the campus resources available. The Student Success Center was developed as a campus wide initiative to foster a sense of responsibility and self-directedness to all S&T students by providing peer mentors, caring staff, and approachable faculty and administrators who are student centered and supportive of student success. Visit the B&MSSC at 198 Toomey Hall; 573-341-7596; success@mst.edu; Facebook: www.facebook.com/SandTssc; web: http://studentsuccess.mst.edu/

Egress Maps: Students should understand where the classroom emergency exits are located and how to vacate the building. You may familiarize yourself with this information using the classroom egress maps posted on-line at http://designconstruction.mst.edu/floorplan/.

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. To contact the MST Title IX Coordinator or 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.