CS673 Software Engineering

Department of Computer Science
Metropolitan College
Boston University

Syllabus

Instructor Information

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Course Information

Prerequisites

MET CS 342 **and** at least one 500- level computer programming-intensive science course or instructor's consent.

(This course is not about programming. However programming skill is the prerequisite. You should be familiar with **OO concept** and proficient in at least **one high-level programming language** before taking this course.)

Reference Books:

Preferred SE Textbook:

- Eric Braude, Michael E. Bernstein. ***Software Engineering: Modern Approaches (2rd Edition).*** Wiley. *(ISDN:978-0-471-69208-9)*

Other SE Textbooks:

- Robert C. Martin. Agile Software Development, Principles, Patterns, and Practices
- Bernd Bruegge and Allen H. Dutoit. Object-Oriented Software Engineering: Using UML, Patterns and Java
- Shari Lawrence Pfleeger, Joanne M. Atlee. Software Engineering: Theory and Practice
- Roger S. Pressman Software Engineering: A Practitioner's Approach
- Hans Van Vilet. Software Engineering: Principles and Practice
- Armando Fox and David Patterson. Engineering Long-Lasting Software: An Agile Approach Using SaaS and Cloud Computing

Other Essential Books for Software Engineers

- Frederick P. Brooks, Jr. The Mythical Man Month
- Elisabeth Freeman, Eric Freeman, Bert Bates, and Kathy Sierra. Head First Design Patterns.
- Martin Fowler, Kent Beck, Don Roberts. Refactoring: Improving the Design of Existing Code

- Steve McConnell. Code Complete: A Practical Handbook of Software Construction

Other Reading Materials

- Microsoft Secure Development Life Cycle: https://www.microsoft.com/en-us/sdl/
- OWASP
  - TOP 10: https://www.owasp.org/index.php/Category:OWASP_Top_Ten_Project
  - Developer Guide: https://www.owasp.org/index.php/Category:OWASP_Guide_Project
  - Testing Guide: https://www.owasp.org/index.php/Category:OWASP_Testing_Project

Please check blackboard learn (https://learn.bu.edu) for more reference materials

Description (from Catalog)

Techniques for the construction of reliable, efficient and cost-effective software. Requirements analysis, software design, programming methodologies, testing procedures, software development tools and management issues. Students design and implement a system in a group project. Laboratory course.

Objectives

At the end of the semester, students are expected to

- Describe and compare major software process models and activities in software process.
- Explain agile methodology and techniques, and apply these in a real-world team-based project to develop high-quality software on time.
- Identify security risks in the software project and apply various techniques to enhance software security.
- Use proficiently various SE tools including UML tool, project management tool, programming tool, testing tool, version control tool etc.
- Communicate effectively with team members and customers.
- Present clearly the software project in both oral and written form.

Course Requirements

- Class participation
- Reading and study
- Semester-long project
- Quizzes and Exam

This course is featured with a semester-long team-based project. Each team should have at about 4-6 students. Every member of the team is expected to contribute a roughly equal share to the project.

Course Polices

Grading Policy

The grade that a student receives in this class will be based on class participation, in-class

exercise, quizzes, project and the exam. The grade is breakdown as shown below. All percentages are approximate and the instructor reserves the right to make necessary changes.

- 10% on class participation
- 10% on written assignments
- 55% on semester-long project
- 25% on final exam

Letter grade/numerical grade conversion is shown below:

A (95-100) A- (90-94)
B+ (85-89) B (80-84) B- (79-77)
C+ (74-76) C (70-73) C- (65-70)
D (60-65) F (0 – 59)

Attendance Policy

Attendance is expected at all class meetings. You are responsible for all material discussed in class. In general, no makeup quizzes and exam will be given unless an extremely good, verifiable reason is given in advance. Please respect your classmates by silencing your cell phones and other electronic devices before class begins.

Assignment Late Policy

All project deadlines are firm. A deadline miss means zero for the grade of that phase. It is the students' responsibility to keep secure backups of all working products.

Academic Integrity

Academic conduct in general and MET College rule in particular require that all references and uses of the work of others must be clearly cited. All instances of plagiarism must be reported to the College for action. *For the full text of the academic conduct code, please check* http://www.bu.edu/met/for-students/met-policies-procedures-resources/academic-conduct-code/.

Course Schedule (Spring 2016)

Lecture Time

Wed 6:00-9:00PM MCSB23

Office Hours:

Wed: 2:30-5:00PM Or by appointment
Feel free to ask me any questions before or after class. You can always contact me by email **Please always add "CS673 (or cs673)" in the subject of your email**.

Class Schedule (tentative schedule, subject to change**)**

Both the lecture and project use iterative approaches. The lecture includes two iterations. The project includes initial planning and 3 iterations.

Class #	Date	Topics	Readings	Project Deadlines
1	01/20	Lecture Iteration 1: Introduction to Software Engineering, Software Process	Part I	Project is assigned Initial planning starts. HW1 (01/20-02/03)
2	01/27	Security Development Life Cycle Software Quality & Security Project Management: Organization	Part I	
3	02/03	Requirement Analysis (User stories) Cost Estimation & Scheduling	Part II	
4	02/10	From requirement to Design (UML diagram: class Diagram, state diagram),	Part II	Initial planning is done. Iteration 1 starts. HW2 (02/10 – 02/24)
5	02/17	Test-Driven Design	Part V	
6	02/24	Design Principles, Refactor	Part VI	
7	03/02	MVC Architecture, Design Patterns related to MVC	Part III	Iteration 1 is done. Demo is presented. Iteration 2 starts HW3 (03/02 -03/16)
	03/09	Spring Recess, No Class		
8	03/16	Lecture Iteration 2: More on Requirement analysis (User case)	Part VI	
9	03/23	More on Requirement analysis (state diagram, sequence diagram)	Part VI	HW4 (03/23- 04/06)
10	03/29	More on coding and testing	Part II	Iteration 2 is done.

				Demo is presented. Iteration 3 starts.
11	04/06	More on Design and Implementation	Part III-V	
12	04/13	More on Security		
	04/20	Monday Schedule, No Class		
13	04/27	Project Presentation		Iteration 3 is done. Whole project is due.
14	05/04	Final Exam		

The above schedule is subjected to change according to the progress of the class and the feedback of the students.

Besides the book chapters, the additional reading material will be assigned for each topic. Reading before and after class is required and essential to succeed in this course. Students are responsible for **ALL** the materials covered in the lectures and lab sessions including any topics not in the textbooks.