CS2004 Fundamentals of Software Engineering

Instructor Information

Name: Mehwish Mumtaz
E-mail: mehwish.mumtaz@lhr.nu.edu.pk

Course Information

Prerequisite:
Level: BS(DS)
Credit Hours: 3
Semester: Spring 2022
Class Venue: Seminar Hall
Class Hours: 5:30 – 7:00 PM Monday and Wednesday
Office Hours: via email

Course Objectives

- Familiarize the students with the term "software engineering," and explain its meaning and importance for the construction of industry-grade software systems.
- Introduce well-known software development process models, their key practices, and their salient features to students.
- Familiarize the students with common methods to specify the requirements of a moderately sized software product.
- Introduce to the students how to prepare software design using UML while keeping the design principles in mind.
- Introduce to the students the most commonly used practices for implementation and delivery of the software.

After studying this course, the students will be able to:

- Differentiate among phases of software development
- Appreciate the relative advantages and disadvantages of well- known software development process models.
- Model requirements and perform design of software
- Distinguish between different types and levels of testing (for instance, unit, integration, systems, and acceptance) for medium- sized software products.
- Develop Work Breakdown Structure for a project.
- Engineer reasonable sized software in team setting

Reference Material

1. Software Engineering: A Practitioner's Approach by Roger Pressman
2. Software Engineering by Ian Sommerville
3. Software Engineering: Theory and Practice by Shari PFleeger and Atlee

4. Software Engineering at Google: Lessons Learned from Programming Over Time Curated by Titus Winters, Tom Manshreck & Hyrum Wright
5. Object-Oriented Modeling and Design with UML, Michael R. Blaha and James R. Rumbaugh, 2nd Edition, Pearson, 2005
6. Clean Architecture: A Craftsman's Guide to Software Structure and Design, First Edition, Robert C. Martin, Pearson 2017

Course Grading - Absolute

- Assignments/Project/Presentations/Quizzes: 40%
- Midterm Exams: 20%
- Final Exam: 40%

[1]The course schedule

S#	Topic	Week(s)	[2]Readings	Assessments
1	Introduction Why software engineering? The impact of time and scale Software engineering vs programming	1		
2	Software process models Agile software development	2	Agile manifesto	
3	Requirements engineering - Traditional and agile - Usecase diagram - Prototyping	3, 4		
4	Software design Modularity, interaction, dependency, cohesion, coupling - Class diagram - Design principles (DIP, etc.)	5		
	MIDTERM EXAM 1	6		
5	Software design contd. - Architecture Design	7		
6	UI design	8		
7	Quality assurance - Quality planning - Testing: unit, integration, regression, black box, etc.	9		
8	Professional software development - configuration management, version control of documents and code - DevOps, CI/CD, etc.	10, 11	git	
9	MIDTERM EXAM 2	12		
10	Software project management - Scoping, Estimation, planning, tracking	13, 14		
11	Presentations, Demos	15, 16		
	FINAL EXAM			

[1]Course schedule is subject to change.

[2] Numbers in square brackets correspond to books numbered in the "Reference Material" section.

Important Information

Announcements
Announcements related to different aspects of this course (e.g. lectures, quizzes, exams, etc.) will be posted on google classroom, which students are expected to check regularly.

Attendance
All students are expected to attend all lectures from beginning to end. Partial or full absence from a lecture may hamper chances of securing good grades.

Exams
Exams will be closed-book and closed-notes. The syllabus for the final exam will be comprehensive.

Office Hours
Students are encouraged to take full advantage of the instructor's office hours. Any doubts regarding concepts covered in class or any questions regarding quizzes, projects, etc. may be clarified during office hours. In case a student is not able to make it during office hours, he/she may schedule an appointment with the instructor for another time slot.

Quizzes
Quizzes may be announced or unannounced. A quiz will usually be about 5 – 10 minutes long and it may be given anytime during the lecture.

Reading Material
Students are encouraged to finish the assigned readings BEFORE the lecture. This is likely to improve lecture comprehension and class participation.

Revision of Grades
Students can contest their grades on quizzes and project deliverables ONLY within a week of the release of grades. Exams will be available for review according to university policies.

Unfair Means
Students are expected to demonstrate the highest degree of moral and ethical conduct. Any student caught cheating, copying, plagiarizing, or using any other unfair means will be strictly dealt with per university policies.