Department of Computer Science

CS309 – Object Oriented Analysis & Design

FALL 2018

Instructor Name: Aamir Raheem
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Office Location/Number: Liberty lab
Office Hours: (after your class)

Course Information

Program: BS/MS   **Credit Hours:** 3   **Type:** Core
Pre-requisites (if any): Data Structures

Course Description/Objectives/Goals:

Purpose of this course is to enable students to analyze, design and implement software systems and applications. The students learn these skills using the modern object-oriented paradigm, which promises reusable, readable and maintainable software components and applications.

Course Learning Outcomes (CLOs):

At the end of the course students will be able to:

1) Understand and appreciate the pillars and advantages of the OO paradigm.
2) Conduct a grammatical parse of a problem statement to identify the relevant abstractions (classes) and their attributes, operations, constraints, and relationships.
3) Analyze a given problem and model it using UML 2 analysis class diagram, use case diagram, and activity diagram(s).
4) Model the static aspects of a solution using a detailed UML 2 design class diagram.
5) Model the dynamic aspects of a solution using different UML 2 state and interaction diagrams.
6) Produce elegant and flexible designs using the concept of design patterns.
7) Implement a given object-oriented design.

Course Textbook

Timothy C. Lethbridge, Robert Laganaiere , Objected-Oriented Software Engineering (2nd Edition), McGraw-Hill, 2005

Additional references and books related to the course:

- Blaha and Rumbaugh, Object-oriented Modeling and Design with UML, Pearson Prentice Hall 2005
- Erich Gamma, et al., Design Patterns: Elements of Re-usable Object-oriented Design, Addison-Wesley, 1999
- Martin Fowler, Refactoring: Improving the Design of Existing Code, Addison-Wesley, 1999
- Grady Booch et al., Object-Oriented Analysis and Design with Applications (3rd Edition), Pearson 2007.

Tentative Weekly Schedule

Week	Topics to be covered
1	Introduction
2	Classes and objects
3	Inheritance and polymorphism
4	Object associations
5	Templates
6	Use case analysis
7	Activity diagrams
8	Class diagrams
9	Sequence diagrams
10	State diagrams
11	Design principles
12	Design patterns (1)
13	Design patterns (2)
14	(Miscellaneous)

(Tentative) Grading Criteria

1. Assignments (20%)
2. Midterm Exams (30%)
3. Final Exam (50%)

Course Policies

1. A student must score a minimum of 50% marks to pass this course
2. 80% attendance is required to appear in the exams
3. Plagiarism is not tolerable in any of its form. Minimum penalty would be an 'F' grade in the course. Students bear all the responsibility for protecting their assignments. In case of cheating, both parties will be considered equally responsible!
4. Assignments must be submitted in time. Late submissions (maximum one week) would result in deduction in marks. Only the submitted articles will be marked.