IS663 – Advanced Sys Analysis & Design

Syllabus

Summer 2016

Instructor

Sameh Sabet

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College of Computing Sciences

New Jersey Institute of Technology

Instructor	Sameh Sabet	**Office Hours**	by appointment (please email first)
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I. COURSE SPECIFICATIONS

Course: IS 663
Course Title: Advanced System Analysis and Design
Prepared: May 2016

II. COURSE OVERVIEW

This course covers the theory, principles, and applications of the methodologies and tools of software analysis and design. Students will read selected material from the literature, actively participate in discussions, labs and exercises and prepare operational projects for real-world problems. We will spend a considerable amount of time interacting and learning through discussion of assigned readings and other material.

III. ACADEMIC INTEGRITY

Students have the responsibility to know and observe the requirements of The NJIT Honor Code of Student Academic Integrity. This code prohibits cheating, fabrication or falsification of information, multiple submissions of academic work, plagiarism, abuse of academic materials, and complicity in academic dishonesty. These standards of academic integrity will be enforced in this course.

IV. GRADE STRUCTURE

ACTIVITY	**POINTS**
Exam	30
Project	40
Labs, Discussions and Participation	30
TOTAL POINTS	**100**

V COURSE TEXTS AND READINGS

A. TEXTS

Required

"Software Engineering," Ian Sommerville, Addison-Wesley, England, 10th Edition

Recommended

"Software Engineering: A Practitioner's Approach," R. Pressman, McGraw Hill, NY 2003.
"Software Requirements: Objects, Functions and States," A. Davis, Prentice Hall, Englewood Cliffs, NJ, 1993.
UML Documentation & White Papers: http://www.rational.com/uml

B. READING ASSIGNMENTS (to be read before the indicated session)

Note: The readings listed below are open to change. I will continue to update (add/remove/modify) the readings if/when I find more relevant papers as the semester progresses. I will, however, keep you informed of the changes as they occur.

VI. PROJECTS

The Projects are an opportunity for you to apply the concepts we will discuss throughout the semester to solve "real-world" problems. Working as a team, you are to demonstrate your mastery of the concepts, methods, tools, and techniques covered in class.

You will be required to view the project from many angles - customer, analyst, developer, tester, manager and end user. You will develop and analyze requirements, project plans, designs and will eventually prototype your design.

Details about the project will be posted on moodle.

Project teams should be made up of 4 to 6 students.

Deliverables

Requirements Package Including Project Plan	**30**
Design Documents	**40**
Prototype & Presentation	**30**

VII. DISCUSSIONS

Your overall grade for this component will be based on the quality of your effort in participating in class discussions and exercises both in class and on moodle.

Each week you are leading class discussions, you are expected to post (on moodle) TWO days ahead of time at least two questions that you would like the rest of the class to contemplate (especially while reading the articles for that class).

Your overall grade for this component will be based on the quality of your effort in leading and participating in class discussions and exercises.

Distance Learning Class Discussion: You will be responsible in participating in online discussion on the week's theme for each class. This assumes you have thoroughly synthesized the information from the readings and has picked out a few relevant points to have a meaningful discussion. The explicit purpose is not to present the readings and/or author's ideas, but also to elicit comments from the rest of the class in a meaningful discussion. A very useful way of doing this is by asking thought-provoking questions. Each student is expected to post (on moodle) TWO days ahead of time (i.e. before Monday of that week) at least TWO questions they would like the rest of the class to contemplate (especially while reading the articles for that class). Please be advised that posting questions late or not at all WILL affect your grade.
At the end of the week (Sunday), each student must then pick TWO questions posted to reply to with their thoughts.

VIII. Class Schedule

Session	Topic	Readings	Deliverables
1 - 05-23	Introduction	CH 1	
2 - 05-30	SDLC Models: Basics, Comparative Analysis	CH2 "Software Chronic Crisis," W. Wayt Gibbs, Scientific American, September 1994, pp. 86-95. "No Silver Bullet" by Fred Brooks, 1987, Brooks87.pdf	Project Teams Formed
3 - 06-06	Process models (cont.) Requirements Engineering Process: Activities, Standards, Documentation	CH 3 "Process Models in Software Engineering" by Walt Scacchi (2001).	Project Proposal
4 - 06-13	Requirements Modeling & Specification	CH 4	

	Overview: Structured and OO Approach, Use Cases, Informal and Formal Specifications, Data Flow Analysis; Methods: Data Flow Diagrams (DFD), Data Dictionary (DD), BNF, Process Description Examples		
5 - 06-20	Requirements Modeling & Specification (Cont.) Methods: Use Cases and Scenarios Examples	CH 5	
6 – 06-27	Project Management, Risk Management Cost Estimation Requirements Management Software Tools for Requirements Management, Modeling & Specification Tools	CH 22, 23,25	
7 – 07-04	Design: Basic Concepts System & Software Architecture Design Methods & Tools	CH 6 "A field study of the software design process for large systems" by Bill Curtis, Herb Krasner, and Neil Iscoe (1988) BC-SDP.pdf"	Proj Plan
8 – 07-11	Design Methods and Notations Transitioning from Requirements to design - heuristics and guidelines Introducing Design Quality: Basic Elements, Cohesion & Coupling, Reviews, Verification (Extra reading)	CH 24	Req Due
9 – 07-18	Object Oriented Analysis & Design (OOAD): Basics Concepts, Static & Dynamic Views, Object Dictionary, OOD Overview UML: Introduction, Notation, Diagrams Design Patterns	CH 7,16, 15 Dewayne E. Perry and Alexander L. Wolf. ``Foundations for the Study of Software Architecture". ACM SIGSOFT Software Engineering Notes, 17:4 (October 1992). – DP-AW-FSA.pdf Abstractions for Software Architecture and Tools to	

		Support Them", M. Shaw, R. DeLine, D. V. Llein, T.L. Ross, D. M.Young and G. Zelesnik, IEEE Transactions on Software Engineering, April 1995, V.21. No 4. UNICON-MS.pdf	
10 – 07-25	Quality Frameworks: SEI Maturity Model & ISO 9000 XP, RUP Design and Requirements for the Internet age	CH 24	Entire Project Package Due
11 – 08-01	Course Summary, Q&A - Exam Preparation		Project Presentations
12 – 08-05 (weekend)	Final		Exam

XI. Grading

Late assignments submissions may be accepted for partial credit, with every day late accruing a 10% penalty.

As a rule of thumb, any assignment you submit to me will be graded and returned within a week.

Online discussion grades will be reflected/updated whenever any other deliverable is graded and posted.

Generally speaking the final letter grades will follow a curve

A	(25%)
B+	(25%)
B	(30%)
C+/C/F	(20%)

X. ANNOUNCEMENTS AND INSTRUCTIONS

Students are responsible for all postings on moodle. Students should check moodle at least two or three times a week for any updates. Any announcements or due dates on moodle take precedence and are final.

***NOTE**: THE SCHEDULES AND PROCEDURES IN THIS COURSE ARE SUBJECT TO CHANGE IN THE EVENT OF EXTENUATING CIRCUMSTANCES. YOU WILL BE NOTIFIED OF DEVIATIONS.*