PART I.
• Catalog Description:
Models of the Software Life Cycle. Requirements Definition and Specification. Formal Specifications. Function-Oriented Analysis and Design. Object- Oriented Analysis and Design. Software Reusability. Software Reliability and Statistical Testing. Defect Testing. Static Verification. Software Maintenance and Reverse Engineering. Software Quality Assurance.

Pre: 11714: Graduate standing in EE, CPE, CS, IT.

• Transcript Title: SOFTWARE ENGINEERING

PART II.
Major, Measurable Learning Objectives

The objectives of this course are to present techniques and methodologies of software engineering: requirements elicitation, writing requirements specifications, structured and object oriented requirements analysis, structured and object oriented design concepts, quality assurance and testing throughout the software lifecycle. The semester project will provide students with the opportunity to work in teams to gather and analyze requirements, write specifications, and develop a prototype of a realistic software project.

Having successfully completed this course, the student will be able to:
   (a) Acquire knowledge of software process, life cycle models, and process improvement techniques and standards
   (b) Be able to apply various requirement elicitation techniques
   (c) Be able to write and validate requirements specifications
   (d) Develop skills to communicate and work effectively as a team
   (e) Be able to perform structured and object oriented analysis
   (f) Acquire knowledge of structured and object oriented design
   (h) Learn various techniques of execution and non-execution based testing, and be able to apply non-execution based testing
       techniques to the verification and validation of requirements

PARTIII. Texts and Special Teaching Aids

• Required Texts:
   Roger Pressman, Software Engineering: A Practitioner's Approach, McGraw-Hill, 2005, Sixth Edition, ISBN 0-07-285318-2.

- Other Course Materials:
  Supplemental journal and conference papers and other supplemental readings will be used to introduce the latest developments and to provide more detailed documentation for projects.

PART IV. Topics

No	Topic	Reading
1	History and overview of software engineering.	Chapter 1
2	Software development process, goals, & principles. Process improvement. Software process models.	Chapter 2, 3 & 4
3	Project management concepts. Teams.	Chapter 21
4	Requirements engineering: elicitation techniques, documentation techniques, and requirements analysis.	Chapters 7
5	Structured analysis: concepts, techniques of performing structured analysis including entity relationship diagrams, data flow diagrams, state transition diagrams.	Chapter 8
6	Object oriented analysis: object oriented concepts, UML, use case, sequence, activity and class diagrams.	Chapters 8
7	Design concepts and principles. Architectural design. Object oriented design.	Chapters 9, 10 & 11
8	Software quality assurance. Software testing strategies and techniques. Non-execution and execution based testing. Object oriented testing.	Chapters 13 & 14
9	Software maintenance.	
10	Project management, estimation, and scheduling.	Chapters 21, 22, 23 & 24

PART V. Tentative Grading

Type of assignment	Percent of Grade
Homework (including paper summary reports)	10%
Class presentations and discussions	5%
Midterm Exam	15%
Survey paper	10%
Term project progress report	5%
Term project and paper	25%
Final exam	30%

- A course map including topics and papers will be provided to the students. Students will prepare for class by submitting a critical analysis summary of their reading assignments. Class participation will be graded on the basis of interaction and quality of discussion.
- During the course students will work in groups of 3 – 4 students to elicit and document the requirements for a software project. The project will be accomplished in a series of 3 deliverables consisting of a final set of 3 documents. The final deliverable and the prototype will be due in the final exam week. All students are required to participate equally in the group project.

- Students will be required to submit a survey paper on a relevant topic selected with instructor's consent. The survey paper must include a well structured representation of the surveyed topic.

Part VI: Honor Code

The Alexandria University honor code will be strictly enforced.