**CSC 510 Software Engineering**

An introduction to software life cycle models, size estimation, cost and schedule estimation, project management, risk management, formal technical reviews, analysis, architecture, design, coding and verification methods, configuration management, and change control, software architectures, and CMMI. Emphasis on software-intensive development projects. An individual research project required that describes state-of-the-art methodologies, approaches, or techniques in the Software Engineering field. Three (3) credit hours.

**Prerequisite**

Undergraduate courses in data structures, probability, applied discrete mathematics, computer organization and the principle of operating systems. An object-oriented language such as C++ or Java is essential. The student is expected to be well versed in programming concepts including distributed systems.

**Course Objectives**

This is a course on the development and management of software-intensive products. It combines a study of methods, tools, and techniques for creating and evolving software products, with the practical skills needed to deliver high-quality software-intensive products at agreed cost and schedule. The methods that are studied include requirements, specification, architecture, design, implementation, verification, validation, operation, and maintenance. The practical side of the course includes a final research project.

**Course Requirements**

HOMEWORK: Three (3) Assignments

EXAMINATIONS: Two (2) Examinations: (Mid-term and Final)

SOFTWARE DEVELOPMENT: N/A

PROJECTS: Individually oriented

**Course Evaluation**

**HOMEWORK: [total 30%]**

There will be three (3) Assignments. These will build on each other and will be individual. The value of each assignment will be 10% each for a total of 30% for all three assignments.

**EXAMINATIONS: [total 50%]**

There will be a Mid-term exam (20%) and Final cumulative Exam.
(30%). Exams will be in principle closed book.

SOFTWARE DEVELOPMENT:

During this course there will not be any software to be developed.

RESEARCH PROJECT: [total 20%]

There will be one research project individually oriented (20%). Students will propose a topic in Software Engineering by September 28\textsuperscript{th} and the instructor will accept or reject the topic. In case of rejection, the student may select from a cluster of topics that the instructor will provide. The Research Project will have a minimum of 25 pages (main text of the paper not including pages for table of contents, title, references, appendices, etc.) double spaced and will involve reading the state-of-the-art papers in the selected topic. The research project will contain at least 20 references (conference papers, journal papers, books) in addition to any web site references. The primary sections for the project will include: (a) Introduction to the topic; (b) literature review on latest work published in the topic; (c) analysis of the topic by the student; (d) analysis on how the topic is relevant to the practice of software engineering; (e) areas where the student sees potential for future research work; (f) conclusions.

Textbook

Primary textbook for the course:


Class notes/presentations and a reading list is utilized during the course. The following textbooks are conventional resources for a graduate-level course in software engineering, and may be purchased if a formal resource is desired.

Computer and Internet Requirements

NCSU has recommended minimum specifications for computers used for classes. Depending on your computer needs, we recommend your computer meet or exceed the following minimum specifications below.

PCs must have an Intel-compatible 800 MHz processor, 256 MB RAM, 8 GB hard drive with 1 GB free space available, 256 Color Display, CD-ROM drive, 800x600 (min.) video adapter, sound card, and speakers. The operating system should be Windows 2000 or XP. Real One Player Basic (available free online) and high speed Internet connection such as cable, DSL, T1 or LAN will be required for EOL courses.

MAC users must have a G3 processor with firewire and USB factory built-in, 256 MB RAM, 10 GB with 1GB free space available, 256 Color Display, CD-ROM drive, 800x600 (min) video adapter, sound card, and speakers. The operating system must be MacOS 10.3 (minimum) along with the above RealOne and Internet specifications above.

For more detailed information on computer specifications and recommendations, please refer to our website at: http://engineeringonline.ncsu.edu/currentstudents/computeraccess.htm

Instructor

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