Cleveland State University
Department of Electrical Engineering and Computer Science

CIS 635 Software Engineering Metrics, Economics and Management

Catalog Data: CIS 635 Software Engineering Metrics, Economics and Management (4-0-4)
Pre-requisite: CIS 634 or consent of the instructor

Course description and Objectives:

Successful software projects need to deal with people and economic considerations, as well as technical considerations. The learning objectives of this course are to enable the student to understand the fundamental principles underlying software management and economics; to analyze management situations via case studies; to analyze software cost/schedule tradeoff issues via to software metrics, software cost estimation tools and microeconomic techniques; and to apply the principles and techniques to practical situations. A special focus will be on rapid application development (RAD), a critical success factor for many projects, and on emerging agile methods for realizing RAD.

Text:

1. Boehm et al., Software Cost Estimation with COCOMO II, Prentice Hall, 2000;
2. Selby, Software Engineering: Barry W. Boehm's Lifetime Contributions to Software Development, Management, and Research, Wiley, 2007

References:

1. Software Engineering Economics , Barry W. Boehm, Prentice Hall PTR, 1981
2. Reifer, Business Case Analysis, Addison Wesley, 2001.

Instructor:

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Course Outline:

Tentative Schedule

	Topic	Reading
Week 1	• Course Overview • Evolution of Software Economics • Software Engineering History & Future	SE 2-2, 2-3, 2-5, SE 8-4, 6-5
Week 2	• Software Risk management I	SE Chapter 5 (5-1 thru 5-5)
Week 3	• Software Risk management II	SE Chapter 5 (5-1 thru 5-5)
Week 4	• COCOMO II details • COCOMO II demo and case study	CII Chapter 1, 2

Week 5	• COCOMO Application Examples • COCOMO Suites	CII Chapter 3, App. A CII Chapter 5
Week 6	• Business Case Analysis • Midterm (March 3)	handouts
Week 7	• Economic Analysis I: Cost-effectiveness Analysis	SEE Chapter 10-12 (handout)
Week 8	• Economic Analysis II: Decision Analysis - • Choice among Alternatives • Midterm Exam (March 5)	SEE Chapter 13-15 (handout)
Week 9	Spring Recess (March 8-15)	
Week 10	• Economic Analysis III: Multiple-goal Decision Analysis • Economic Analysis IV, Risk Analysis • Value-Based SE – theory and Process • Theory W Software Management	SEE Chapter 16-18 (handout) SEE Chapter 19-20 (handout); SE 2-2 SE 4-2, 9-3, 9-5 SE 7-1, 7-2
Week 12		
Week 13	• COTS-Based Processes and COCOTS	SE 1-4, 1-6, 9-4
Week 14	• Software Planning & Control • Commercial Rapid Development	SEE 32, SE 6-2, 6-4
Week 15	• Outsourcing, Global Development • CMMI; Lean Six Sigma	SE 9-1 handouts
Week 16	• Class Review • Project Presentations	

SE-Software Engineering

CII-Software Cost Estimation with COCOMO II

Grading:

Midterm Exam	25% (WED., March 4)
Final Exam	35% (WED., May 6)
Quizzes/Home works	20%
Term Paper	20%Wed.

Exam Policy: You will be allowed to use your text book for all examinations. However, this reference will be restricted to tables and charts in the book. You will need a calculator that can compute exponent.

Homework Policy: All homework and assignments are due at the beginning of the class on the specified date. Except for group project, all assignments must be individually and independently completed and must represent the effort of the student turning in the assignment. Should two or more students turn in substantially the same solution or program for individual assignment, all involved will receive a zero grade for that assignment. Second offense will result into a "F" grade for the course.

Late assignment: No late assignment will be accepted. You must turn in what you have accomplished to get partial grade.

Term Paper

The term paper should be about 25 pages long (plus or minus a factor of 2; clarity of understanding and evidence of independent thinking are much more important than length). Some example topics for a term paper are:

* A study of a software project, analyzing how its management practices compared with the principles of software management and economics covered in the course, and relating the comparisons to the successes or failures of the project.

* An analysis of a particular aspect of software management and economics, in the context of the course materials plus additional material.

If you have a different topic you would like to pursue, that is fine. Just describe it in your term paper outline that you turn in January 28, 2015

There will be two term paper deliverables:

* The outline, describing your main choice of theme for the paper and its expected contents, due at the beginning of class on January 28, 2015

The term paper, due at the last day of the class on April 29, 2015