



Stevens Institute of Technology

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Syllabus

SSW540: Introduction to Quantitative Software Engineering

Semester taught:	Start and end date of the semester: http://www.stevens.edu/registrar/
Professor Name: Gregg T. Vesonder Office address: none – adjunct faculty	Office Hours: web based
Office phone number: E-mail address: gvesonde@stevens.edu	Course Web Address: http://elearn.stevens.edu http://homepage.mac.com/vesonder

Overview

This course provides the student with a working knowledge of the terms, principles and methods of Software Engineering, with emphasis on the topics described in the IEEE’s Software Engineering Body of Knowledge, <http://www.swebok.org/> . It also addresses other topics and skills essential for a career in software engineering including project management, open source software and management management. This course establishes bedrock knowledge necessary to practice software engineering in software projects and to pursue further courses in software engineering

Prerequisites

Bachelors degree in Computer Science or equivalent

Learning Goals

After taking this course, the student will be able to:

- Begin to introduce some software engineering methods and practices in their development and development they manage
- Evaluate new methods and practices in Software engineering
- Enroll in advanced courses in software engineering and build on the bedrock knowledge established in the course

Pedagogy

The course is a webct course and each week will follow this schedule: Monday morning an annotated lecture in pdf format will be made available, on Wednesday two discussion topics will be provided and you must participate in at least one discussion each week – the discussion ends the following Tuesday and on Thursday a weekly quiz is made available that must be completed by midnight Sunday. During the semester you also are required to keep a log recording your insights on software engineering. Examples of student log entries can be found at my blog, <http://vesonder.typepad.com/universe/> . At the end of the tenth week at least five entries in “doc” or “txt” format should be collected in one file and emailed to me using the webct email system. In addition during the semester there will be 2 tests and a final. The two tests during the term will occur on the fifth and ninth weeks. The first test covers lectures one to four and the second test lectures five to eight. The final is cumulative with special emphasis on lectures nine through thirteen.

Required Text(s)

1 Bernstein, L and Yuhas, C.M., Trustworthy Systems Through Quantitative Software Engineering, Wiley, 2005, ISBN 0-471-69691-9 (BY)
2 Brooks, F.P The Mythical Man-month: Essays on Software Engineering, 20th Anniversary Edition, Addison-Wesley, ISBN: 0201835959(B)

Required Readings

Readings will be assigned for each week. See weekly descriptions in the table below.

Assignments

The course will emphasize understanding the principles and methodologies of software engineering.

Class Participation - To enhance the learning experience, all students are expected to participate in class discussion board by responding to the discussion topics posted by the professor and the postings by other students.

1. Logbooks with at least entries must be sent to the professor using webct mail by the end of the tenth week of class. The postings should be contained in one file in either word or plain text formats. No pdf's!
2. Quizzes – Quizzes will be posted on Thursdays of each week and must be taken by the Sunday of that week.
3. The schedule for tests and the final is listed in the table at the end of this document. Tests will be posted on Monday and must be taken by the following Sunday.

The assignments and their weights are as shown below:

1. Quizzes, Class Participation, discussion	15%
2. Logbook	15%
3. Test 1	20%
4. Test 2	20%
5. Final	30%
TOTAL	100%

Please note that assignments in this class may be submitted to www.turnitin.com, a web-based anti-plagiarism system, for an evaluation of their originality.

Course Schedule

Week	Subject	Assignment Due
1	Introduction to Software Engineering - reading BY chapter 1	<ol style="list-style-type: none"> 1. Quantitative Software Engineering Overview 2. Software Process Models 3. CMM and the SEI 4. Software Engineering Code of Ethics
2	Software Requirements - reading BY chapter 3 & B chapter 1	<ol style="list-style-type: none"> 1. Managing software projects - Introduction to Brooks 2. Software Project Planning 3. Requirements
3	Software Estimation - reading BY chapter 6 & B chapter 2	<ol style="list-style-type: none"> 1. Estimating 2. Function Points 3. COCOMO 4. Delphi 5. Wideband 6. Risk Analysis (pass 1)
4	Software Engineering Case Studies - reading BY pages 39-48 & B chapters 3, 4 and 5	<ol style="list-style-type: none"> 1. Scheduling 2. Software Project reviews 3. MULTICS - case study 4. Software Factories 5. Software Archeology
5	Quality and Test on lectures 1 through 4 - reading BY pages 393 to 398 & Brooks chapter 6	<ol style="list-style-type: none"> 1. Infrastructure 2. Quality Assurance 3. Development Standards 4. Configuration and Build Management 5. Operations, Administration and Maintenance 6. TEST 1
6	Software Testing - reading BY chapter 11	<ol style="list-style-type: none"> 1. Testing - cradle to grave 2. Configuration Management
7	Software Architecture and Design - reading BY chapter 5 and pages 223 to 248 & B chapters 7, 8, 9 and 10	<ol style="list-style-type: none"> 1. Systems Engineering 2. Analysis and Modeling 3. Architecture 4. Design
8	Techniques supporting Software Engineering - reading BY pages 248 to 268	<ol style="list-style-type: none"> 1. Supporting Techniques <ol style="list-style-type: none"> a. Quantitative, Stats and Graphing b. Survey Methods 2. Problem Solving 3. Meeting Methods 4. Negotiation - Easy Win-Win 5. Management management 6. Fault Tolerance
9	Object Oriented Methodology and Test 2	<ol style="list-style-type: none"> 1. Object Oriented Analysis 2. Object Oriented Design 3. Object Oriented Testing

Week	Subject	Assignment Due
	on lectures 5 through 8 - reading BY chapter 4 and pages 346-353 & B chapters 11, 12 and 13	<ol style="list-style-type: none"> 4. Object Oriented Metrics 5. Prototyping 6. TEST 2.
10	Agile Methodologies and Logbooks due - reading BY pages 40 to 61	<ol style="list-style-type: none"> 1. Light vs. Heavy methodologies 2. Extreme Programming 3. Crystal Methodology 4. Log Books Due
11	Open Source Development - reading B chapters 16 and 17	<ol style="list-style-type: none"> 1. Open Source Development 2. Game Development 3. Anti-Patterns
12	Human Computer Interaction, Open Source - reading BY chapter 9 & B chapter 14 to end.	<ol style="list-style-type: none"> 1. Computer Human Interaction 2. Software Factories 3. Software Archeology
13	Special Topics in Software Engineering - reading Parnas paper	<ol style="list-style-type: none"> 1. Fault Tolerance
14	Final Exam	