

CS 540: Fundamentals of Quantitative Software Engineering I

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Bernstein, L and Yuhas, C.M., Trustworthy Systems Through Quantitative Software Engineering, Wiley, 2005, ISBN 0-471-69691-9 (BY)

Brooks, F.P The Mythical Man-month: Essays on Software Engineering, 20th Anniversary Edition, Addison-Wesley, ISBN: 0201835959(B)

I often say when you can measure what you are speaking about, and express it in numbers, you know something about it.

- Lord Kelvin, 1883 (from Peters & Pedrycz, 2000)

- ◆ Class 1 - Monday, August 29th, :BY1
 - a. Quantitative Software Engineering Overview
 - b. Software Process Models
 - c. CMM and the SEI
 - d. Software Engineering Code of Ethics
- ◆ Class 2 - Monday, September 12th: BY3, B1
 - a. Managing software projects - Introduction to Brooks
 - b. Software Project Planning
 - c. Requirements
- ◆ Class 3 - Monday September 19th : BY6, B2
 - a. Metrics
 - b. Estimating
 - i. Function Points
 - ii. COCOMO
 - iii. Delphi
 - iv. Wideband
 - c. Risk Analysis (pass 1)
- ◆ Class 4 - Monday, September 26th :BY pp39-48, B3-5
 - a. Scheduling
 - b. Software Project reviews
 - c. MULTICS - case study
 - d. Software Factories
 - e. Software Archeology
- ◆ Class 5 - Monday, October 3rd :BY p393-398,B6
 - a. Infrastructure
 - i. Quality Assurance

- ii. Development Standards
 - b. Configuration and Build Management
 - c. Operations, Administration and Maintenance
 - d. **TEST 1**
- ◆ Class 6 - Tuesday, October 11th :BY11
 - a. Testing - cradle to grave
 - b. Configuration Management
- ◆ Class 7 - Monday, October 17th :BY5,pp223-247, B7-10
 - a. Systems Engineering
 - b. Analysis and Modeling
 - c. Architecture
 - d. Design
- ◆ Class 8 - Monday, October 24th :BY pp248-268
 - a. Supporting Techniques
 - i. Quantitative, Stats and Graphing
 - ii. Survey Methods
 - b. Problem Solving
 - c. Meeting Methods
 - d. Negotiation - Easy Win-Win
 - e. Management management
 - f. Fault Tolerance
- ◆ Class 9 - Monday, October 31st :BY4, pp346-353, B11-13
 - a. Object Oriented Analysis
 - b. Object Oriented Design
 - c. Object Oriented Testing
 - d. Object Oriented Metrics
 - e. Prototyping
 - f. (costumes optional)
- ◆ Class 10 - Monday, November 7th :BY pp49-61
 - a. Light vs. Heavy methodologies
 - b. Extreme Programming
 - c. Crystal Methodology
 - d. **TEST 2**
- ◆ Class 11 - Monday, November 14th :BY9, B14-15
 - a. Computer Human Interaction - 1
- ◆ Class 12 - Monday, November 21st :BY9, B14-15
 - a. Log Books due!
 - b. Computer Human Interaction - 2
 - c. Open Source
 - d. Game development
- ◆ Class 13 - Monday, November 28th :vV18, B15-end, Parnas paper
 - a. Anti-Patterns

- b. Parnas paper
- c. Reliability
- d. Other Methods
- e. Outsourcing
- ◆ Class 14 - Monday, December 5th :BY8
 - a. Risk analysis (pass 2)
 - b. Review
- ◆ Exams- Monday, December 12th
 - a. FINAL

Supplemental Readings

Parnas, D.L. and Wurges, H. "Response to undesired events in software systems." In D. M. Hoffman and D.M. Weiss, *Software fundamentals: Collected papers by D.L. Parnas*, 2001.

Grading Policy

There will be two tests during the term each worth 25% of the grade and a final worth 35% of the grade. Each student will be required to keep a logbook that records on a weekly basis your thoughts on Software Engineering either from the lectures, readings and exercises or your experience as a software engineer for other class or work related projects. This logbook will be worth 10% of your grade. The remaining 5% of your grade will be based on participation both in class and on the blog.

Ethical Conduct

The following statement is printed in the Stevens Graduate Catalog and applies to all students taking Stevens courses, on and off campus.

"Cheating during in-class tests or take-home examinations or homework is, of course, illegal and immoral. A Graduate Academic Evaluation Board exists to investigate academic improprieties, conduct hearings, and determine any necessary actions. The term 'academic impropriety' is meant to include, but is not limited to, cheating on homework, during in-class or take home examinations and plagiarism."

Consequences of academic impropriety are severe, ranging from receiving an "F" in a course, to a warning from the Dean of the Graduate School, which becomes a part of the permanent student record, to expulsion.

Reference: The Graduate School Catalog, Academic Year 2002-2003: Stevens Institute of Technology, pp. 27-28.