ID2002 Value-Based Software Engineering 7.5 credits

Value-Based Software Engineering

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for ID2002 valid from Autumn 2007

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Specific prerequisites

Basic knowledge in software engineering

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

The course is an advanced software engineering course focused on deeper studies in specific software management and economics topics, and the emerging value-based software engineering paradigm. The learning objectives of the course are to enable the students to get knowledge about:

- Research and trends in value-based software engineering - Major value-based software engineering concepts and techniques and how they address current and emerging software engineering challenges, opportunities, and problem areas - Applying the concepts and techniques to representative case studies - Understanding how different types of models are integrated in modern software development - Fundamental principles of software management and economics - Analyzing performance/cost/schedule tradeoffs via modern software cost estimation tools and microeconomic techniques - Performing comparative analyses of modern software management and development methods; Balancing agility and discipline in software development- Applying decision analysis models and techniques in software engineering to support the value-based paradigm.

Course contents

- Value-based versus value-neutral software engineering

- Concurrent software and system engineering. Model-based architecting and software system engineering

- Value-based monitoring and control of software products and product lines

- Stakeholders value propositions and reconciliation

- Continuous risk and opportunity management

- Cost-benefit and business case analyses of software products and product lines

- Comparative analyses of modern software management and development methods. Balancing agility and discipline: risk-based methodology and process

- Software cost modeling and estimation techniques: past, present, and future.

- Performance models, cost-effectiveness models, software production functions, decision criteria

- Net value, present value, figures of merit

- System reliability and availability, mathematical optimization techniques, software analysis, copying with unreconciliable goals

- Risk, uncertainty, and the value of information.

Course literature

Value-Based Software Engineering, S.Biffl,A.Aurum,B.Boehm,H.Erdogmus,P.Grunbacher (Eds.)

Upplaga: Förlag: Springer-Verlag År: 2006

ISBN: 3-540-25993-7

Övrig litteratur

Required reading

A.J. Stoica: Value-Based Software Engineering (Compendium)

Recommended reading

S. Biffl, A.Aurum, B.Boehm, H. Erdogmus, P. Grunbacher: Value-Based

Software Engineering, Springer Verlag, 2006

B. Boehm and R. Turner: Balancing Agility and Discipline in Software

Development, Addison Wesley, 2003

J. Highsmith: Agile Software Development Ecosystems, Addison Wesley, 2003

D. Ahern, A.Clouse, and R. Turner: CMMI Distilled, Addison Wesley, 2001

D. Reifer: Business Case Analysis, Addison Wesley, 2001

B. Boehm et al.: Software Cost Estimation with COCOMO II, Prentice Hall, 2000

J.Thorp and DMR: The Information Paradox, McGraw Hill, 1998

B. Boehm: Software Engineering Economics, Prentice Hall, 1981

Examination

- PRO1 - Assignment, 4.5 credits, grading scale: P, F
- TEN1 - Examination, 3.0 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Written examination (TEN1; 2p).). Group assignments/project (PRO1; 3p).

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.