Blekinge Institute of Technology
Department of Software Engineering

COURSE SYLLABUS

Mätningar av programvara

Software Metrics

7,5 ECTS credit points (7,5 högskolepoäng)

Course code: PA2559
Educational level: Second cycle
Course level: A1N
Field of education: Technology
Subject group: Computer Technology

Subject area: Software Engineering
Version: 8
Applies from: 2016-09-01
Approved: 2016-10-01

1 Course title and credit points

The course is titled Software Metrics/Mätningar av programvara and awards 7,5 ECTS credits. One credit point (högskolepoäng) corresponds to one credit point in the European Credit Transfer System (ECTS).

2 Decision and approval

This course is established by Dean 2016-08-30. The course syllabus was revised by Head of Department of Software Engineering and applies from 2016-09-01.
Reg.no: BTH-4.1.1-0406-2016

3 Objectives

To understand, assess and control software and software development projects, one must be able to measure various aspects of software and its development. The measurement may concern for example the software's quality, the efficiency of processes and tools, or the productivity of the staff. Measurements make it possible to detect and diagnose problems and to follow up whether various actions have had the desired effect.
The goal of the course is to provide students with the fundamentals of software measurement. Students will acquire knowledge of how measurements can be used to control, manage and predict software development processes. Students will also acquire a basic understanding of measurement processes and an awareness of the problems associated with software measurement, as well as experience in creating measurement models and carry out measurements.

4 Content

The course comprises the following modules:
•Basics of measurement: the need for measuring, measurement frameworks. This includes measurement theory (scales, validation and meaningfulness), Goal-Question-Metric (GQM) paradigm, collection and analysis of data, classification of software metrics.
•Metrics for Software: internal product attributes, external product attributes, resource measurements, quality models (ISO/IEC 9126 and 25010).
•Processes for software measurement: process models (ISO/IEC 15939), introducing measuring program.

5 Aims and learning outcomes

Knowledge and understanding
On completion of the course the student should be able to:
• present and discuss the basics of measuring software,
• present, argue and discuss in a professional manner, how metrics can be used in software development processes.
Skills and abilities
On completion of the course the student should be able to:
• apply the GQM framework in a real context,
• apply measurements in a professional manner in a real context.
Values and attitudes
On completion of the course the student should be able to:
•Present, argue and discuss issues related to software measurement in a professional manner.

6 Learning and teaching

The teaching consists of lectures in which students are expected to take active part through discussion, questions and personal experiences. The course also comprises mandatory exercises with fixed deadlines.
The course commences with an introductory lecture and continues with a series of lectures where a number of subjects (see Contents) is introduced. Each lecture includes time for discussions and exercises.

The course comprises three mandatory examinations: an assignment, a project and a written exam. The assignment and the project require that students immerse themselves in an assigned topic related to metrics and measurement, and to apply the acquired knowledge in a given context / project.
English

7 Assessment and grading
Examination of the course

Code	Module	Credit	Grade
1705	Review assignment	2 ECTS	A-F
1715	Project Assignment	4 ECTS	A-F
1725	Written exam	1.5 ECTS	A-F

The course will be graded A Excellent, B Very good, C Good, D Satisfactory, E Sufficient, FX Fail, supplementation required, F Fail.To get a passing grade for the course, all modules must be approved. The final grade of the course is the unweighted, rounded average of the grades of the modules.

8 Course evaluation
The course coordinator is responsible for systematically gathering feedback from the students in course evaluations and making sure that the results of these feed back into the development of the course.

9 Prerequisites
Completed courses of at least 120 ECTS credits including completed courses in Programming, Data structures and Algorithms, and Software Engineering or Team Software Engineering Project. In addition completed courses in Mathematics of at least 15 credits are required.

10 Field of education and subject area
The course is part of the field of education and is included in the subject area Software Engineering.

11 Restrictions regarding degree
The course cannot form part of a degree with another course, the content of which completely or partly corresponds with the contents of this course.

12 Additional information
This course replaces PA1407

13 Course literature and other teaching material
Course literature
Software Metrics - A Rigorous & Practical Approach, 3rd edition
Authors: N. E. Fenton, J. Bieman
Publisher: CRC Press
Published: 2015
ISBN: 978-1-4398-3822-8
Reference literature
1. Software Measurement?: Establish, Extract, Evaluate, Execute
Authors: Christof Ebert, Reiner Dumke
Publisher: Springer
Published: 2007
ISBN: 978-3-540-71648-8
2. Software Metrics: A Guide to Planning, Analysis and Application
Authors: C. Ravindranath Pandian
Publisher: Auerbach Publications, CRC Press Company
Published: 2003
ISBN: 9780849316616
3. Metrics and Models in Software Quality Engineering, 2nd edition
Author: Stephan H. Kan
Publisher: Addison-Wesley Publishing Company
Published: 2002
ISBN: 0201729156
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