Blekinge Institute of Technology
Department of Computer Science

COURSE SYLLABUS

Prestandaoptimering

Performance Optimization

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

Course code: DV1567
Educational level: First cycle
Course level: G2F
Field of education: Technology
Subject group: Computer Technology

Subject area: Computer Science, Software Engineering
Version: 5
Applies from: 2017-08-01
Approved: 2017-03-01
Disused: 2023-04-04

1 Course title and credit points
The course is titled Performance Optimization/Prestandaoptimering 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 2017-02-21. The course syllabus was revised by Head of Department of Computer Science and Engineering and applies from 2017-08-01.
Reg.no: BTH-4.1.1-0215-2017.
Replaces: DV1463.

3 Objectives
Performance is an important aspect of all software. In order to develop good and high-performance software, it is essential that students have a good understanding of and can apply the different methods and techniques to analyze and optimize the performance of a software system.

4 Content
The course includes the following elements:
- overview of which factors that effect performance in a computer system
- the hardware and platform components that effect software performance
- methods for performance measurement and instrumentation
- performance and scalability testing
- methods to model and analyze the performance of computer and software systems
- high-level and low-level optimizations
- methods and techniques to improve software performances and scalability (including an overview on distributed and parallel programming)

5 Aims and learning outcomes
Knowledge and understanding
On completion of the course the student will:
•provide a general account of how a modern computer system is constructed and how it affects performance
•provide a detailed account of different ways to test and measure software performance and scalability
•provide a general account of different ways to model software systems and analyzed their performance and scalability
•provide a detailed account of different techniques to improve the performance and scalability of software systems.
Skills and abilities
On completion of the course the student will:
•test, measure and analyse the performance of a software system
•identify performance problems
•perform appropriate optimisations to improve performance and scalability
•develop simple performance model of a software system
•apply different techniques to improve the performance of software systems in practice.
Approach and ability to evaluate
On completion of the course the student will:
•explain and justify their solutions to laboratory and project assignments in both speech and writing
•independently and critically evaluate their own and others' solutions.

6 Learning and teaching
The theoretical basics in the course is presented in lectures and / or exercises. The student is also expected to independently gain theoretical knowledge through independent study of relevant literature. Theoretical knowledge is then applied practical both in teacher-led mandatory laboratory exercises and partly in project assignments carried out individually or in groups within a given time frame.
English

7 Assessment and grading
Examination of the course

Code	Module	Credit	Grade
1710	Laboratory	1 ECTS	G-U
1720	Project 1	2 ECTS	A-F
1730	Project 2	2 ECTS	A-F
1740	Exam	2.5 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.The final grade for the course is determined as an average of the grades obtained in Project 1, Project 2 and Exam. The final grade will only be issued when all components have been approved.

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
Admission to the course requires completed course in Programming, 15 ECTS credits and Datastructures and Algorithms, 6 ECTS credits,Computercommunication 4 ECTS credits,Realtimesystems and operatingsystems 6 ECTS credits.

10 Field of education and subject area
The course is part of the field of education and is included in the subject area Computer Science and the subject area Software Engineering. The course can also be 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 Course literature and other teaching material
Main literature
Software Performance and Scalability: a quantitative approach, Herry H.Liu, 2009, Wiley-Blackwell, ISBN 978-0-470-46253-9.
Reference literature
Performance Solutions: A Practical Guide to Creating Responsive, Scalable Software, C.U. Smith & L.G. Williams, Addison-Wesley, 2001, ISBN10: 0201722291.
Foundation of Software and System Performance Engineering: Process, Performance modeling, Requirements, Testing, Scalability and Practice, André B. Bondi, 2015, Pearson Education Inc., ISBN13: 978-0-321-83382-2.
Model Based Software Performance Analysis, Vittorio Cortellessa et al., 2011, Springer Verlang, ISBN13: 978-3-642-42761-9.
Computer Architecture – A Quantitative Approach, 4th edition?J.L. Hennessy & D.A. Patterson, Morgan Kaufmann Publishers, 2006, ISBN13: 978-0-12-370490-0.
■