ID2203 Distributed Systems, Advanced Course 7.5 credits

Distribuerade system, fortsättningskurs

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

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

Establishment

Course syllabus for ID2203 valid from Spring 2019

Grading scale

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

Education cycle

Second cycle

Main field of study

Computer Science and Engineering,Information Technology

Language of instruction

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

Intended learning outcomes

The course complements Distributed Systems, Basic Course, and prepares the students for M.Sc projects, and Ph.D. studies in the area of distributed systems.

The main objective of this course is to provide the students with a solid foundation for understanding, analyzing and designing distributed algorithms for reliable distributed systems.

More specifically after the course is completed the student will:

- Know how to specify the properties of distributed algorithms, so called liveness and safety properties.
- Explain the different models of distributed systems, including failure and timing models.
- Master basic algorithms for failure detection, leader elections, broadcast and multicast, basic shared memory in distributed systems, agreement protocols, and group communication.
- Practice in design and implementation of selected distributed algorithms in middleware designed for group communication.

Course contents

Topics:

- Models of distributed algorithms
- Event-based programming
- Failure detectors and leader elections
- Reliable broadcast and epdimic algorithms
- Shared memory models
- Consensus and agreement
- Group communication and view synchrony
- Stabilization algorithms
- Impossibility proofs

Specific prerequisites

120 university credits (hp) in engineering or natural sciences and documented proficiency in English corresponding to English A.

Course literature

Reliable Distributed Programming, Rachid Guerraoui and Luis Rodrigues
Upplaga: Förlag: Springer År: 2006. ISBN: 3-540-28845-7

Övrig litteratur:

Textbook: Gerard Tel, Introduction to Distributed Algorithms, Second Edition, Cambridge University Press, ISBN +-521-79483-8.

Textbook: Distributed Computing: Fundamentals, Simulations, and Advanced Topics, Wiley Series on Parallel and Distributed Computing

Examination

- LAB1 - Laboratory Work, 3.0 credits, grading scale: P, F
- TEN1 - Examination, 4.5 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.

Other requirements for final grade

Lab. assignement (LAB1; 3 hp)
Exam (TEN1; 4,5 hp)

Midterm exam (10 point) has a weight of 10% given as bonus point.Final exam (TEN1; 4.5 hp) (70 points) has a weight of 70% of the final result. The practical part of the course (LAB1; 3 hp) consists of 4 parts, three parts are compulsory and gives 30 points (of weight 30%), and the fourth gives 10 extra bonus points.

For the final grade the following is valid:

A: 90 points or higher
B: 75-89 points
C: 65-74 points
D: 55- 64 pointsE: 45-54 points
Fx: 40-44 points
F: less than 40 points

For approved grade (E or higher) the following should be satisfied:

- The student has completed the compulsory part of LAB1.
- The student should be able to explain the different models of distributed system.
- The student should be able to specify the properties of distributed algorithms.

For higher grade the student should be able to master the basic algorithm tested according to the exam.

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.