DD2354 Algorithms and Complexity 6.0 credits

Algoritmer och komplexitet

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

Establishment

Course syllabus for DD2354 valid from Autumn 2008

Grading scale

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

Education cycle

Second cycle

Main field of study

Computer Science and Engineering, Information Technology, Information and Communication Technology

Specific prerequisites

Language of instruction

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

Intended learning outcomes

The goals of the course are to give the students

- the fundamental skills needed to develop algorithms using data structures and analyze their correctness and efficiency,
- an introduction to complexity theory,

so that they will be able to

- design programs that use computer resources efficiently,
- realize that there are problems that are impractical or even impossible to solve by a computer.

Course contents

Principles for construction of algorithms: Decomposition, greedy algorithms, dynamic programming. Algorithm analysis. Probalistic algorithms. Approximation. Selected applications to sets, graphs, arithmetic, and geometry.

Computability and complexity: Reduction. Complexity classes P (polynomial time), NP (non-deterministic polynomial time), and NC (efficiently parallelizable problems). NP-complete problems. Undecidable problems.

Course literature

To be announced at least 2 weeks before course start at the web page for the course.

Examination

- MAS2 - Test, 1.5 credits, grading scale: A, B, C, D, E, FX, F
- MAS1 - Test, 1.5 credits, grading scale: A, B, C, D, E, FX, 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

Test (MAS1; 1,5 university credits and MAS2; 1,5 university credits), examination (TEN1; 3 university credits).

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.