DD2440 Advanced Algorithms 6.0 credits

Avancerade algoritmer

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

The official course syllabus is valid from autumn semester 2024 according to the decision of Director of First and Second Cycle Education: J-2024-0736.Date of decision: 2024-04-04

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

- Knowledge in algorithms and complexity, 7.5 higher education credits, equivalent to completed course DD1352/DD2350/DD2352.
- Knowledge in discrete mathematics, 7,5 higher education credits, equivalent to completed course SF1610/SF1630/SF1662/SF1679/SF1688.

- Knowledge in probability theory and statistics, 6 higher education credits, equivalent to completed course SF1910-SF1925/SF1935.

Language of instruction

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

Intended learning outcomes

After passing the course, the student should be able to

- explain different advanced algorithmic concepts such as randomized algorithms, approximation algorithms and fixed-parameter algorithms
- analyse, select, use and verify algorithms that are based on the above concepts
- develop efficient algorithms that are based on the above concepts
- independently explore existing advanced algorithms, implement them and improve them using heuristics
- communicate algorithmic ideas in a clear and formal way

in order to

- design and evaluate computer programs that utilise computer resources efficiently.

Course contents

The course will describe and analyse a number of algorithms for combinatorial computational problems.

Algorithmic concepts: randomized algorithms, approximation algorithms, fixed-parameter algorithms.

Examination

- ÖVN1 - Exercise, 6.0 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.

ÖVN1 consists of group tasks and individual assignments that are reported in writing and a group project that is reported in writing and orally.

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.