DD1320 Applied Computer Science 6.0 credits

Tillämpad datalogi

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

Establishment

The official course syllabus is valid from the autumn semester 2026 according to the decision by director of first and second cycle education. Decision date: 2026-03-10

Grading scale

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

Education cycle

First cycle

Main field of study

Information Technology, Technology

Specific prerequisites

Knowledge and skills in programming, 6 higher education credits, equivalent to completed course DD1310-DD1319/DD1321/DD1331/DD1333/DD1337/DD100N/ID1018/ID1022.

Intended learning outcomes

After passing the course, the student should be able to

- systematically test programs to discover errors

- use abstraction as a tool to simplify the programming
- use programming interfaces
- select an appropriate algorithm for a given problem
- compare algorithms with regard to time and memory usage
- implement different algorithms for searching and sorting and give an account of their properties
- formulate and implement recursive algorithms
- model problems as search problems and implement algorithms for breadth-first search, depth-first search and best-first search
- describe basic compression algorithms and for which types of compression they are used
- implement stacks, queues, binary search trees, general trees, hash tables and hash functions and use these
- use priority queues
- identify problems where the data structures above are useful and design simple algorithms with these
- use simple encryption methods and explain the principles of asymmetric encryption
- use algorithms for text searching, regular expressions and BNF syntax

in order to

- become a good problem solver using programming
- be able to use computational methods in application projects
- acquire sufficient prior knowledge to be able to take advanced courses in computer science.

Course contents

In this course, the student will further develop their knowledge from the course in programming. The programming language used in the course is Python.

Algorithms and data structures: A systematic presentation of computer science concepts: abstract data types, algorithm analysis, recursion, stacks, queues, lists, searching, sorting, hashing, priority queues, trees, search trees, problem trees, text searching, simple syntax analysis, encryption.

Programming: Abstraction. Modularisation. Testing. Programming interfaces.

Examination

- LABD - Programming assignments, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- KONT - Partial exams, 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.

For higher grades on KONT, oral examination or computer exam is used. Which of the examination forms will be used is stated in the course memo.

Transitional regulations

TEN1 has been replaced by KONT.

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.