DD1325 Applied Computer Science with Ethics 7.5 credits

Tillämpad datalogi med etik

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

Establishment

Course syllabus for DD1325 valid from Autumn 2018

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

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 will be able to

- systematically test programs to discover errors,
- use abstraction as a tool to simplify programming,
- choose a suitable algorithm for a given problem,
- compare algorithms with respect to time and memory usage,
- describe different algorithms for searching and sorting and their properties,
- devise and implement recursive algorithms,
- write a small BNF syntax for a formal language and write a program to check if an expression conforms to the syntax,
- model real problems as search problems and implement algorithms for breadth first, depth first and best first search,
- describe basic compression algorithms and know in which types of compression they are used,
- construct an automaton for text search and describe how it works,
- implement and use stacks and queues,
- implement insertion, traversal and search operations in binary search trees and general trees, and use these,
- implement and use hash tables and hash functions,
- use priority queues,
- identify problems where the above mentioned data structures are of use and construct simple algorithms with these,
- analyze and evaluate ethical c,onsequences of computer applications

in order to:

- become proficient in solving problems with programming,
- be able to use computer science methods in projects in different applications,
- acquire sufficient grounding to be able to enroll in follow-up courses in computer science.

Course contents

Algorithms and data structures: A systematic study of the concepts abstract data types, stacks, queues, lists, trees, searching, sorting, and recursion using the knowledge the students have from the course Programming Technique. Hashing. Priority queues. Search trees. Problem trees. Text search. Simple syntax analysis. Algorithm analysis.

Programming: Program quality. Modularization. Testing. Documentation. Exceptions. System calls. Library functions.

Elementary ethics: Fundamental concepts, computer ethics.

Course literature

To be announced at least 4 weeks before the course starts at the web page for the course.

Examination

- LABD - Programming assignments, 3.0 credits, grading scale: A, B, C, D, E, FX, F
- ETIK - Ethics assignments, 1.5 credits, grading scale: P, 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.

In this course all the regulations of the code of honor at the school apply, see: http://www.kth.se/csc/student/hederskodex/1.17237?l=en_UK.

Under special circumstances, other examination formats may be used.

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.