

Data Structures

Datastrukturer
6 credits

Programme course

TND004

Valid from: 2022 Spring semester

Determined by	Main field of study	
Board of Studies for Computer Science and Media Technology	Computer Science and Engineering, Media Technology and Engineering	
Date determined	Course level	Progressive specialisation
2021-09-01	First cycle	G2X
Revised by	Disciplinary domain	
	Technology	
Revision date	Subject group	
	Computer Technology	
Offered first time		
Spring semester 2009		
Department		
Institutionen för teknik och naturvetenskap		

Course offered for

- Master of Science in Media Technology and Engineering
- Master of Science in Electronics Design Engineering

Prerequisites

Programming in C++

Intended learning outcomes

The aim of the course is to give students the tools to independently be able to create programs that solve practical problems dealing with large amounts of data, taking into account efficient use of time and memory. Upon completion of the course the student should fulfill the following learning outcomes.

- To propose specific data structures and algorithms to address practical problems.
- To motivate objectively the choices made, concerning chosen data structures, and relate to the known scientific results in the field.
- To analyze the trade offs, regarding efficiency in several aspects, of different data structures proposed for addressing a practical problem.
- To implement and use the data structures and algorithms in application programs.

Course content

Algorithm analysis. Recursion. Lists, stacks and queues. Trees and tree traversals. Binary search trees, threaded trees and balanced trees. Hashing and hash tables. Priority queues and binary heaps. Sorting och searching. Graphs and graph traversals. Fundamental graph algorithms.

Teaching and working methods

Lectures, lessons, and laboratory work.

Examination

TEN1	Written examination	3 credits	U, 3, 4, 5
LAB1	Laboratory work	3 credits	U, G
UPG1	Optional assignment	0 credits	U, G

The optional assignment consists of two quizzes. Results on the quizzes will give credits to the computer examination (and re-examination until the month of October after the course is completed).

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is “Swedish”, the course as a whole could be given in Swedish, or partly in English. Examination language is Swedish, but parts of the examination can be in English.
- If teaching language is “English”, the course as a whole is taught in English. Examination language is English.
- If teaching language is “Swedish/English”, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English depending on teaching language.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

If special circumstances prevail, the vice-chancellor may in a special decision specify the preconditions for temporary deviations from this course syllabus, and delegate the right to take such decisions.