UNIVERSITY OF SKÖVDE

TRANSLATION FROM SWEDISH

COURSE SYLLABUS

Algorithms and Data Structures G1F

7.5 credits

Course code: IT405G
Version number: 4
Valid from: 1 July 2023
Ratified by: Curriculum Committee for Informatics
Date of ratification: 17 November 2022

1. General information about the course

The course is provided by the University of Skövde and is named Algorithms and Data Structures G1F (Algoritmer och datastrukturer G1F). It comprises 7.5 credits and is a first-cycle course. The level of progression is G1F.

The course is a part of the main field of study in Informatics. The disciplinary domain of the course is Technology.

2. Entry requirements

The course has the following entry requirements: (attended MA126G Discrete Mathematics G1N or passed MA113G Algebra and Logic G1N) and (passed IT141G Programming Methodology G1N or passed IT120G Programming Fundamentals with C++ G1N) (or the equivalent).

3. Course content

The course contains fundamental knowledge regarding the use of data structures and approaches for designing/assessing algorithms. The course teaches basic data structures based on the STL of C ++ , basic algorithms (searching, sorting, graphs) and general principles for designing and implementation of them.

4. Objectives

After completed course the student should på able to:

- use the complexity theory properly,
- describe and use basic data structures such as hash tables, trees and priority queues,
- comprehend and use some fundamental and advanced sorting algorithms,
- describe and implement graphs and apply essential algorithms to solve “All Shortest Paths” problems,
- understand basic general principles for design and implementation of algorithms, such as greedy algorithms, divide and conquer, dynamic programming and backtracking, and
- use relevant parts of the Standard Template Library (STL) in C++.

5. Examination

The course is graded A (Excellent), B (Very good), C (Good), D (Satisfactory), E (Sufficient) or F (Fail).

The examinations of the course consist of the following modes of assessment:

- **Supervised written examination**
  6 credits, grades: A/B/C/D/E/F
- **Laboratory assignments**
  1.5 credits, grades: G/U

Students with a permanent disability who have been approved for directed educational support may be offered adapted modes of assessment.

6. Types of instruction and language of instruction

The teaching is comprised of lectures and laboratory sessions.

The teaching is conducted in English.

7. Course literature and other educational materials

Course literature according to instructions on the course page on the learning platform.

8. Student influence

Student influence in the course is ensured by means of course evaluation. The students are informed about the results of the evaluation and potential measures that have been taken or are planned, based on the course evaluation.

9. Additional information

Further information about the course, as well as national and local governing documents for higher education, is available on the website of the University of Skövde.