

# Syllabus

for course at first level

**Computer Science for Mathematicians**  
**Datalogi för matematiker**

**7.5 Higher Education**  
**Credits**  
**7.5 ECTS credits**

<b>Course code:</b>	DA3018
<b>Valid from:</b>	Autumn 2021
<b>Date of approval:</b>	2016-11-21
<b>Changed:</b>	2021-04-29
<b>Department</b>	Department of Mathematics (incl. Math. Statistics)
<b>Main field:</b>	Computer Science
<b>Specialisation:</b>	G1F - First cycle, has less than 60 credits in first-cycle course/s as entry requirements

## Decision

This syllabus has been approved by the Board of Science at Stockholm University, 17 August, 2020, and revised 29 April, 2021.

## Prerequisites and special admittance requirements

For course admission knowledge equivalent to Programming Techniques for Mathematicians, FL, 7.5 credits (DA2004) is required.

## Course structure

Examination code	Name	Higher Education Credits
PRO1	Project	1.5
THE1	Theory	3
LAB1	Practical Exercises	3

## Course content

a. The course covers: work with programming and data projects, including command line work in Linux and similar OS, and practical development tools. Basic algorithms and data structures and their properties, including search and sorting, stacks and queues, hashing. Time and memory complexity. Recursion. Abstraction as a tool to simplify programming.

b. The course includes the following modules:

Module 1 Theory, 3 credits

Module 2 Practical Exercises, 3 credits

Module 3 Project Assignment, 1.5 credits

## Learning outcomes

It is expected that the student after taking the course will be able to:

- work efficiently on the command line and with Unix scripts, and use development tools for programming projects (modules Practical Exercises, Project Assignment),
- use and implement basic sorting algorithms, depth first and width first search, stacks, queues, hash tables, and similar data structures (modules Theory, Practical Exercises, Project Assignment),
- analyze and compare algorithms with regard to time and memory complexity (modules Theory, Practical Exercises, Project Assignment).

## **Education**

The education consists of lectures, project work, and practical exercises.

The language of instruction of the course is specified in the digital course catalogue.

## **Forms of examination**

a. The course is examined in the following manner:

Assessment of module 1 Theory takes place through written exam.

Assessment of module 2 Practical Exercises takes place through oral presentations by computer.

Assessment of module 3 Project Assignment takes place through written project report.

The examiner can decide on adapted or alternative examination formats for students with disabilities.

If the instruction is in English, the examination may also be conducted in English.

b. The course has no compulsory instruction.

c. Grading: The course's final grade is set according to a seven-point criterion-referenced scale:

A = Excellent

B = Very good

C = Good

D = Satisfactory

E = Adequate

Fx = Failed, some additional work is required

F = Failed, much additional work is required

Grading of the module Theory is set according to the seven-point criterion-referenced scale.

Grading of the module Practical Exercises is set according to the seven-point criterion-referenced scale.

Grading of the module Project Assignment is set according to a 2-point scale:

G = Pass

U = Fail

A passing final grade requires passing grades on all included modules.

The final grade of the course is determined by weighing the grades from all course modules, where each grade is weighed in relation to the scope of the course modules.

d. Grading criteria for the course will be distributed at the start of the course.

e. Students who receive a failing grade on a regular examination are allowed to retake the examination as long as the course is still provided. The number of examination opportunities is not limited. Other mandatory course elements are equated with examinations. A student who has received a passing grade on an examination may not retake the examination to attain a higher grade. A student who has failed the same examination twice is entitled to have another examiner appointed, unless there are special reasons to the contrary. Such requests should be made to the department board. The course normally includes three examination opportunities for each course module per academic year the course is offered. For the academic years that the course is not offered, at least one examination opportunity is offered.

f. Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination session.

## **Interim**

Students may request that the examination be conducted in accordance with this course plan even after it has ceased to be valid. However, this may not take place more than three times over a two-year period after the course was discontinued. Requests must be made to the department board. The provision also applies in the case of revisions of the course syllabus and revisions of the required reading.

## **Limitations**

The course may not be included in a degree together with the courses Computer Science II (DA3001) and Object Oriented Programming (DA3002).

## **Misc**

The course is a component of the Bachelor's Programmes in Mathematics, and Mathematics and Computer Science, and it can also be taken as a separate course.

## **Required reading**

Course literature is decided by the department board and published on the department's web site at least 2 months prior to course start.