Syllabus

for course at first level

Computer Science for Mathematicians	**7.5 Higher Education**
Datalogi för matematiker	**Credits**
	7.5 ECTS credits

Course code:	DA3018
Valid from:	Spring 2017
Date of approval:	2016-11-21
Department	Department of Mathematics (incl. Math. Statistics)
Main field:	Computer Science
Specialisation:	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, 21 November, 2016.

Prerequisites and special admittance requirements

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

Course structure

Examination code	Name	Higher Education Credits
THEO	Theory	1.5
LABO	Practical Exercises	3
PROJ	Project Assignment	3

Course content

a. The course covers: work with programming and data projects, including command line work in Linux and similar OS, unit testing, and version management. Abstraction as a tool to simplify programming. Time and memory complexity. Recursion. Basic algorithms and their properties, including seach and sorting, stacks and queues, hashing. Basics of parallel programming.

b. The course includes the following elements:
• Theory, 1.5 HECs
• Practical Exercises, 3 HECs
• Project Assignment, 3 HECs

Learning outcomes

It is expected that the student after taking the course will be able to:
• work on the command line and e.g. use version management systems and unit tests,
• analyze and compare algorithms with regard to time and memory complexity,
• use and implement basic sorting algorithms, depth first and width first search, stacks, queues, hash tables, and similar data structures,
• write simple routines with processes and threads.
The expected learning outcomes belong to all course elements.

Education

The education consists of lectures and practical exercises.
The language of instruction is English.

Forms of examination

a. Examination for the course is in the following manner: measurement of knowledge takes place through written examination, written and oral presentation of the practical exercises, and written project report. The course is examined in English.

b. Grading is carried out according to a 7-point scale related to learning objectives:
A = Excellent
B = Very Good
C = Good
D = Satisfactory
E = Sufficient
Fx = Fail
F = Fail

Grading of the element Practical Exercises is carried out according to a 2-point scale:
G = Pass
U = Fail

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

d. A minimum grade of E on all course elements is required to pass the course.
The final grade of the course is set by a weighting of the grades on the course elements THEO and PROJ, where the grades of the different parts are weighted according to their extent.

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 departmental board. The course has at least two examinations for each academic year in the years in which instruction is provided. Intervening years include at least one examination.

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 course instruction has ended. Requests must be made to the departmental board. The provision also applies in the case of revisions to the course plan.

Limitations

The course may not be included in a degree together with the course Computer Science I, FL (DA2001), or the equivalent.

Misc

The course is a component of the Bachelor's Programme in Mathematics, and it can also be taken as an individual course.

Required reading

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