Department of Mathematics (incl. Math. Statistics)

Stockholm University

Syllabus

for course at first level

Programming Techniques
Programmeringsteknik

7.5 Higher Education Credits
7.5 ECTS credits

Course code:	DA2005
Valid from:	Autumn 2020
Date of approval:	2020-01-13
Department	Department of Mathematics (incl. Math. Statistics)

Main field:	Computer Science
Specialisation:	G1N - First cycle, has only upper-secondary level entry requirements

Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University, January 13, 2020.

Prerequisites and special admittance requirements

Swedish upper secondary school courses English B and Mathematics C, or equivalent.

Course structure

Examination code	Name	Higher Education Credits
LABO	Practical Exercises	3
INDU	Individual Assignment	3
THEO	Theory	1.5

Course content

The course covers: Fundamental computer concepts. Programming in a modern programming language (Python). Data structures and classes. Problem solving by dividing the problem into sub-problems. Program structuring. Several small programming exercises and one larger, individual programming exercise with emphasis on structuring and specification of the modules being used.

b. The course includes the following elements:
• Practical Exercises, 3 ECTS credits
• Individual Assignment, 3 ECTS credits
• Theory, 1.5 ECTS credits

Learning outcomes

The expected learning outcomes are dealt with in all three course sections.

It is expected that the student after taking the course will be able to:
• follow the rules of the programming language syntax,
• apply and explain the rules of good programming style (such as user friendliness, comments, error handling, structuring, flexibility),
• detect and correct programming errors,
• modify a given program
• transfer data between files and programs,

• identify where control structures (conditionals and loops) are needed, and use these,
• split a large problem into manageable parts and construct functions for these,
• use built-in data structures and select data structures that are suitable for the current problem,
• use classes and construct new classes,
• review other people's programs,
• use other people's programs as building blocks in one's own projects,
• use tools to develop programs together with other developers,
• solve problems, independently and in groups, by designing programs of up to five hundred lines in a modern programming language.

Education
The education consists of lectures and practical exercises.

The language of instruction is stated before each course opportunity and is shown in the digital education catalog.

Forms of examination
a. Examination for the course is in the following manner: written examination of the element Theory, written presentation of the element Practical Exercises, and written and oral examination of the element Individual Assignment.
The examiner has the opportunity to decide on an adapted or alternative examination for students with disabilities. Late submission of Individual assignment has consequences for the course's final grade, which is further described in the course's grading criteria. If the teaching is in English, examination may also be conducted in English.

b. For passing the final grade, participation in the examination of practical exercises is required and individual information on peer assessment is used. If special reasons exist, the examiner may, after consultation with the relevant teacher, grant the student exemption from the obligation to participate in certain compulsory teaching. Some campus presence may be required for presentation of practical exercises and individual assignment.

c. 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

Grading of the element Individual Assignment is carried out according to a 7-point scale related to learning objectives.

Grading of the element Theory is carried out according to a 7-point scale related to learning objectives.

For a passing the course, a pass grade is required for all course components. The final grade of the course is set by weighing the grades on the components Theory and Individual Assignment, where the grades of the different parts are weighted in relation to their scope.

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. Such requests should be made to the departmental board. The course has at least three 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, 15 ECTS credits (DA2001), Programming Techniques for Mathematicians, 7,5 ECTS credits (DA2004), Programming Techniques, 7,5 ECTS credits (DA2003), Programming, Numerical Methods and Statistics for Physicists, 15 ECTS credits (FK4026), or the equivalent.

Misc

The course is a single subject course.

Required reading

Course literature is decided by the departmental board and published at the Department of Mathematics' website at least 2 months before the course starts.