Department of Mathematics
(incl. Math. Statistics)

Stockholm University

Syllabus

for course at advanced level

Computer Science
Datalogi

30.0 Higher Education Credits
30.0 ECTS credits

Course code:	DA7061
Valid from:	Autumn 2018
Date of approval:	2014-10-06
Changed:	2018-01-15
Department	Department of Mathematics (incl. Math. Statistics)
Main field:	Computer Science
Specialisation:	A1N - Second cycle, has only first-cycle course/s as entry requirements

Decision

This syllabus has been approved by the Board of the Faculty of Science at Stockholm University, October 6, 2014, and revised January 15, 2018.

Prerequisites and special admittance requirements

For course admission knowledge equivalent to the following is required: Software Engineering and Project Work, FL, 9 HECs (DA3015), Database Technology, FL, 6 HECs (DA3014), Algorithms and Complexity, FL, 7.5 HECs (DA3004), Human-Computer Interaction I, SL, 7.5 HECs (DA7041), and Swedish B/Swedish 3.

Course structure

Examination code	Name	Higher Education Credits
BIDS	Image Analysis and Computer Vision	7.5
KPLX	Complexity Theory	7.5
KRYP	Foundations of Cryptography	7.5
MODD	Modern Database Systems and Their Applications	7.5
PROS	Software Safety and Security	7.5
PROT	Software Reliability	7.5
SEMT	Seminars on Theoretical Computer Science	7.5
VISU	Visualization	7.5
ANDA	Artificial Neural Networks and Deep Architectures	7.5
MAIN	Machine Learning	7.5

Course content

a. The course covers four advanced items in Computer Science. The range of items can vary between different academic years. The following sub areas can be mentioned: databases, internet technology, operating systems, program system construction. A list of the items for the present year is available at the department resposible for the course.

b. The course consists of four of the following items:
• Artificial Neural Networks and Deep Architectures, 7.5 HECs
• Image Analysis and Computer Vision, 7.5 HECs
• Complexity Theory, 7.5 HECs
• Foundations of Cryptography, 7.5 HECs

• Machine Learning, 7.5 HECs
• Modern Database Systems and Their Applications, 7.5 HECs
• Software Safety and Security, 7.5 HECs
• Software Reliability, 7.5 HECs
• Seminars on Theoretical Computer Science, 7.5 HECs
• Visualization, 7.5 HECs, 7.5 HECs

Learning outcomes

It is expected that the student after taking the course will:
• be familiar with computer science methods
• have knowledge of some advanced applications of computer science
• be able to independently apply computer science methods in problem solving
• be prepared for professional work as a computer scientist and a basis for graduate studies in computer science or an adjacent subject area

Education

The education consists of lectures, exercises, seminars, and practical exercises.

Participation in practical exercises and seminars, and group education associated with this, is compulsory. The examiner may rule that a student is not obliged to participate in certain compulsory education, if there are special grounds for this, after consultation with the relevant teacher.

Forms of examination

a. Examination for the course is in the following manner, depending on the chosen course items:

Artificial Neural Networks and Deep Architectures: measurement of knowledge takes place through written examination, and written and oral presentation of practical exercises.

Image Analysis and Computer Vision: measurement of knowledge takes place through written examination, and written and oral presentation of practical exercises.

Complexity Theory: measurement of knowledge takes place through written and oral presentation of assignments.

Foundations of Cryptography: measurement of knowledge takes place through written and oral presentation of assignments.

Machine Learning: measurement of knowledge takes place through written examination, and written and oral presentation of practical exercises.

Modern Database Systems and Their Applications: measurement of knowledge takes place through written and oral presentation of assignments and group project.

Software Safety and Security: measurement of knowledge takes place through written and oral presentation of assignments and practical exercises.

Software Reliability: measurement of knowledge takes place through written examination, and written and oral presentation of practical exercises.

Seminars on Theoretical Computer Science: measurement of knowledge takes place through written and oral presentation of assignments.

Visualization: measurement of knowledge takes place through written presentation of assignments, and written and oral presentation of group project.

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

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

d. A minimum grade of E is required to pass the course, together with passing practical exercises, and participation in all other compulsory education.

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 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 is carried out in accordance with this syllabus even after it has ceased to apply. This right is limited, however, to a maximum of three times during 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, Advanced Course II (NA3190), Specialized Course in Computer Science (NA4020), First Degree Programme in Mathematics-Computer Science, Computer Science Branch, 4th year (NA8660–NA8710), First Degree Programme in Mathematics-Computer Science, Computer Science Branch, 4th year (NA8750–NA8760), or the equivalents.

Misc

The course is a component of the Master’s Programme in Computer Science, and it can also be taken as an individual course.

Required reading

Course literature is decided by the departmental board and is described in an appendix to the syllabus.