Department of Mathematics
(incl. Math. Statistics)

Stockholm University

Education plan

for

Bachelor's Programme in Scientific Computing
Kandidatprogram i beräkningsteknik

180.0 Higher Education Credits
180.0 ECTS credits

Programme code:	NBERK
Valid from:	Autumn 2007
Date of approval:	2006-10-18
Department:	Department of Mathematics (incl. Math. Statistics)

Decision

This study programme syllabus has been approved by the Board of the Faculty of Science at Stockholm University.

Prerequisites and special admittance requirements

Swedish upper secondary school courses Mathematics D and Physics B, or equivalent.

Programme structure

The programme starts with studies in mathematics, basic programming and mechanics. The 2nd year the mathematics studies are deepened, the first course i numerical methods is given, and also a project course that is the first example of what scientific computing implies. The 3rd year a number of courses are given that deepens the knowledge in scientific computing even further, e.g. High Performance Computing and Object Oriented Programming. In addition a number of elegible courses, suitable as a starting point for the Degree Project. Depending on the choice of elegible courses the student can aim at e.g. software development or scientific computing applications.

Goals

For a Degree of Bachelor in the main field of Scientific Computing the student must
• demonstrate knowledge and understanding in the main field of Scientific Computing, including knowledge of the scientific basis of the field, knowledge of Scientific Computing methods, in-depth knowledge of some part of Scientific Computing and a general sense of current research issues,

• demonstrate an ability to seek, gather and critically interpret information that is relevant to a problem and to critically discuss phenomena, issues and situations,

• demonstrate an ability to independently identify, formulate and solve problems and to perform tasks within specified time limits,

• demonstrate an ability to present and discuss information, problems and solutions in dialogue with different groups, orally and in writing,

• demonstrate the skills required to work independently in the Scientific Computing field,

• demonstrate an ability to make assessments in the Scientific Computing field, taking into account relevant scientific, social and ethical aspects,

• demonstrate insight into the role of knowledge in society and into people's responsibility for how knowledge is used, and

• demonstrate an ability to identify his/her need of further knowledge and to upgrade his/her capabilities.

Courses

Year 1, compulsory courses
• Mathematics, FL (MM2001)
• Computer Science I, FL (DA2001)
• Mechanics, FL (FK3003)*
• Matlab in Mathematics and Mechanics, FL (BE3001)*

Year 2, compulsory courses
• Linear Algebra, FL (MM5004)
• Mathematical Analysis III, FL (MM5001)
• Mathematical Analysis IV, FL (MM5002)
• Numerical and Applied Mathematics, FL (MM7008)*
• Computer Science II, FL (DA3001)
• Project Course in Scientific Computing, FL (BE3005)*

Year 3, compulsory courses
• Introduction to High Performance Computing (BE3006)*
• Applied Numerical Methods, FL (BE3007)*
• Program System Construction using C++, FL (DA3007)*
• Writing Technology and Typography with Computer Support, FL (DA3006)*
• Scientific Computing, Degree Project. FL (BE6001)*

Elegible courses, at least one of:
• Mathematical Models, Analysis and Simulation I, SL (BE7002)*
• Computational Fluid Dynamics, SL (BE7004)*
• Visualization; as Computer Science, SL (DA7014)*
• Electromagnetism, FL (FK4010)*
• Linear Analysis, SL (MM7005)*

Elective courses: 7.5-12 HECs

* The course is part of the main field of study - Scientific Computing.

Degree

Bachelor degree.

Misc

Students, admitted to the programme, that have not completed it within the planned three years of study, may request to complete the programme even after the study programme syllabus has ceased to apply. In this case the limitations stated in the syllabus for each course included in the programme do apply.
The Department of Mathematics, and the Department of Physics, Stockholm University, also takes part in the programme.