Department of Mathematics (incl. Math. Statistics)

Stockholm University

Syllabus

for course at first level

Numerical Methods	**7.5 Higher Education**
Numeriska metoder	**Credits**
	7.5 ECTS credits

Course code:	BE3003
Valid from:	Autumn 2009
Date of approval:	2007-08-28
Changed:	2008-10-13
Department	Department of Mathematics (incl. Math. Statistics)

Subject	Mathematics
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, August 28, 2007, revised September 17, 2008.

Prerequisites and special admittance requirements

For course admission knowledge equivalent to the following is required: Computer Science I, FL, 15 HECs (DA2001), and Mathematics I, FL, 30 HECs (MM2001).

Course structure

Examination code	Name	Higher Education Credits
THEO	Theory	4.5
LABO	Practical Exercises	3

Course content

a. The course covers
• basic ideas and concepts in numerical methods
• linear and non-linear equations and systems of equations
• over-determined linear and non-linear systems of equations
• linear and non-linear model fitting
• interpolation
• integral estimation
• defect correction (Richardson extrapolation)
• perturburations and condition
• ordinary differential equations, initial-value and boundary-value problems
• orientation of partial differential equations

b. The course includes the following elements:
• Theory, 4.5 HECs
• Practical Exercises, 3 HECs

Learning outcomes

It is expected that the student after taking the course will:
• be able to use, analyse and implement basic numerical methods,
• be able to use mathematics software (Matlab) and value the results,

• orally, and in writing, be able to evaluate and present results of his/her calculations and computer simulations

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

Forms of examination
a. Examination for the course is in the following manner: measurement of knowledge of the element Theory takes place through written and/or oral examination.

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 pass of the element Practical Exercises.

e. Students who fail to achieve a pass grade in an ordinary examination have the right to take at least further four examinations, as long as the course is given. The term "examination" here is used to denote also other compulsory elements of the course. Students who have achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. Students who have failed to reach a pass grade on two occasions have the right to request that a different teacher be appointed to set the grade of the course. A request for such appointment must be sent to the departmental board.

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 occasions during a two-year-period after the end of giving the course. A request for such examination must be sent to the departmental board.

Limitations
The course may not be included in a degree together with the course Numerical Methods, Basic Course (BT1010), Numerical Methods for Physicists (BT1000), Numerical Methods for Physicists I, FL (BE3002), Numerical and Applied Mathematics (BT2030), Numerical and Applied Mathematics, FL (BE3004), or the equivalents.

Misc
The course is a component of the Bachelor's Programme in Biomathematics, the Bachelor's Programme in Computer Science, and 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 is described in an appendix to the syllabus.