Syllabus
for course at first level

Numerical Analysis

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7.5 Higher Education Credits

7.5 ECTS credits

Course code:	MM5014
Valid from:	Spring 2016
Date of approval:	2015-11-16
Department	Department of Mathematics (incl. Math. Statistics)
Main field:	Mathematics/Applied Mathematics
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 Faculty of Science at Stockholm Univeristy 2015-11-16.

Prerequisites and special admittance requirements

To qualify for the course knowledge equivalent to Mathematics II - Linear algebra, 7.5 ECTS credits (MM5012), is required.

Course structure

Examination code	Name	Higher Education Credits
N001	Numerical Analysis, theory	4.5
N002	Computer-aided problem solving	1.5
N003	Project	1.5

Course content

a. The course covers:
* error calculus and error analysis, analysis of convergence of numerical methods
* orientation regarding approximation theory, orthogonal polynomials
* non-linear equations
* numerical linear algebra, linear systems of equations, eigenvalue problems
* numerical integration
* interpolation and extrapolation
* ordinary differential equations with initial and boundary value problems

b. The course consists of the following parts:
* Theory (4.5 ECTS credits)
* Computer-aided Problem Solving (1.5 ECTS credits)
* Project (1.5 ECTS credits)

Learning outcomes

Upon completion of the course, the student is expected to be able to:

Part 1, Theory, 4.5 ECTS credits:
* explain basic concepts in numerical methods

* use numerical methods to solve theoretical and applied problems

Part 2, Computer-aided Problem Saloving, 1.5 ECTS credits:
* use software for simple problem solving

Part 3, Project, 1.5 ECTS credits:
* orally and in writing be able to explain the solution of a problem in numerical methods

Education
Instruction is given in the form of lectures, exercise sessions and computer laborations.

Forms of examination
a. The course is examined by a written exam, laborations, and oral as well as written presentations.

b. Grading is carried out according to a 7-point scale related to the learning objectives of the course:

A = Excellent
B = Very Good
C = Good
D = Satisfactory
E = Sufficient
Fx = Fail, some more work is required
F = Fail, a lot more work is required

Grading of part 2 and part 3 is carried out according to a 2-point scale: pass (G) or fail (U).

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

d. A grade of at least pass on every part of the course is required to pass the course.

e. Students who fail an ordinary examination are entitled to take additional examinations as long as the course is offered. There is no restriction on the number of examinations. The term "examination" here is used to denominate also other compulsory elements of the course. A student who has achieved a pass grade on an examination may not retake this examination in order to attempt to achieve a higher grade. A student who has failed to reach a pass grade on two occasions have the right to have a different teacher appointed to set the grade of the course, unless there are special reasons against it. A request for such appointment must be sent 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. An opportunity to make up from grade Fx to a pass grade is not given for this course.

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 within a two-year-period after the end of the course offering. A request for such examination must be sent to the departmental board. This provision is also valid in the case of revision of the syllabus.

Limitations
The course may not be included in a degree together with the course Numerical methods 7.5 ECTS credits (BE3003), Programming, numerical methods and statistics for physicists (FK4026) or the equivalent.

Misc
The course can be taken within the Bachelor program in Mathematics. It can also be takes as an individual course.

Required reading
Course literature is decided by the departmental board and is announced on the department website at least 2 months before the start of the course.