Syllabus

for course at first level

Mathematical modelling I	**7.5 Higher Education**
Matematisk modellering I	**Credits**
	7.5 ECTS credits

Course code:	MM5025
Valid from:	Spring 2017
Date of approval:	2016-10-03
Department	Department of Mathematics (incl. Math. Statistics)
Main field:	Mathematics/Applied Mathematics
Specialisation:	G2F - First cycle, has at least 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 2016-10-03.

Prerequisites and special admittance requirements

For admission to the course, knowledge is required equivalent to the courses Mathematics II - Analysis, part A, 7.5 credits (MM5010), Mathematics II - Linear Algebra, 7.5 credits (MM5012), Probability Theory I, 7.5 credits (MT3001). Also required is knowledge equivalent to Programming Techniques for Mathematicians, 7.5 credits (DA2004). English B/English 6 or equivalent.

Course structure

Examination code	Name	Higher Education Credits
F101	Project	3.5
F102	Mathematical modelling - theory	4

Course content

Mathematical modelling of subjects in natural and social sciences through geometry, trigonometry, classical and linear algebra, differential and integral calculus, ordinary and partial differential and difference equations, graphs, variational calculus, dynamical programming, mathematical programming and the maximum/minimum principle.

Learning outcomes

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

Part 1, Project Work, 3.5 ECTS credits:
* present a basic problem in mathematical modelling, orally and in writing,
* use software for basic problem solving.

Part 2, Mathematical modelling - theory, 4 ECTS credits:
* define and describe what a mathematical model is,
* explain possible approaches to modeling process,
* set up a mathematical model under given conditions,
* prove rigorously the underlying theorems provided in the course.

Education

Instruction is given in the form of lectures, exercise sessions, computer labs and seminars.

Forms of examination

a. The course is examined in the following manner:
Assessment of module F101, Project Work, takes place through hand-in exercises and oral presentations.
Assessment of module F102, Mathematical modelling - theory, takes place through a written exam.

b. Grading: The course's final grade is set according to a seven-point criterion-referenced scale:
A = Excellent
B = Very good
C = Good
D = Satisfactory
E = Adequate
Fx = Failed, some additional work is required
F = Failed, much additional work is required

Grading of part F101 Project Work is carried out according to a 3-point scale: pass with distinction (VG), pass (G), or fail (U).

c. The course's grading criteria are handed out at the start of the course.

d. The following is required to pass the course:
* at least a pass grade on part F101 Project Work.
* at least grade E on part F102 Mathematical modelling - theory.

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, unless there are special reasons to the contrary. Such requests should be made to the department board.

The course includes at least two examination opportunities per academic year the course is offered. For the academic years that the course is not offered, at least one examination opportunity is offered.

f. Students awarded the grade Fx are given the opportunity to improve their grade to E. The examiner decides on the supplementary assignments to be performed and the pass mark criteria. The supplementary assignments will take place before the next examination opportunity.

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 of the course syllabus.

Required reading

Course literature is decided by the departmental board and is published at the web site of the Department of Mathematics (www.math.su.se) at least two months before course start.