



# Syllabus

for course at first level

**Stochastic Processes and Simulation I**  
**Stokastiska processer och simulering I**

**7.5 Higher Education  
Credits**  
**7.5 ECTS credits**

<b>Course code:</b>	MT4002
<b>Valid from:</b>	Autumn 2007
<b>Date of approval:</b>	2006-09-27
<b>Department</b>	Department of Mathematics (incl. Math. Statistics)
<b>Subject</b>	Mathematical Statistics
<b>Specialisation:</b>	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 on 27 September 2006.

## Prerequisites and special admittance requirements

Prerequisites for the course is a course equivalent Probability Theory I, FC, 7.5 hp.

## Course structure

Examination code	Name	Higher Education Credits
TENT	Stochastic Processes and Simulation I, exam	6
LABO	Computer Exercises	1.5

## Course content

- The course covers conditional distribution and conditional expectation, Markov chains in discrete and continuous time, birth and death processes, the Poisson process and basic stochastic simulation.
- The course includes the following elements:
  - Theory, 6 hp
  - Computer Exercises, 1.5 hp

## Learning outcomes

It is expected that the student after taking the course will be able to:

- \* define basic concepts in the theory of stochastic processes
- \* solve simple problems on stochastic processes
- \* carry out simple stochastic simulation using mathematical computer programs
- \* give written presentation of a stochastic simulation

## Education

The education consists of lectures, exercises, computer exercises and tests. Participation in the computer exercises is compulsory. An 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

- Examination for the course is in the following manner: measurement of knowledge takes place through written 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 E is required to pass the course, together with approved written presentation of computer 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 "Stochastic processes and Simulation I" (MS 1190).

### **Misc**

The course is a component of the Bachelor's Programme in Mathematics, Bachelor's Programme in Biomathematics, and Bachelor's Programme in Mathematics and Economics, 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.