

# Syllabus

for course at advanced level

**Probability Theory  
Sannolikhhetsteori**

**7.5 Higher Education  
Credits  
7.5 ECTS credits**

<b>Course code:</b>	ST721A
<b>Valid from:</b>	Autumn 2010
<b>Date of approval:</b>	2010-02-24
<b>Department</b>	Department of Statistics
<b>Main field:</b>	Statistics
<b>Specialisation:</b>	A1N - Second cycle, has only first-cycle course/s as entry requirements

## Decision

This syllabus was approved by the Board of the Department of Statistics on April 25, 2007.

## Prerequisites and special admittance requirements

Bachelors' Degree including at least 90 ECTS credits in Statistics or equivalent.

## Course structure

Examination code	Name	Higher Education Credits
11SE	Probability Theory	7.5

## Course content

The course consists of the following part:

1. Probability Theory.

The course covers the foundations of probability theory in a mathematical and rigorous way. It addresses various axiom systems and probability spaces, univariate and multivariate distributions, transformations, conditional random variables, hierarchical models, characteristic functions, different forms of convergence and limit theorems.

The course is a good basis for further courses at a postgraduate level in statistics.

## Learning outcomes

After completing the course, students should be able to:

- use advanced probability theory to construct probability models for a few selected applications
- explain important theorems in probability theory
- solve somewhat more complex probability theory problems
- explain the concepts of convergence in probability theory

## Education

Teaching forms consist of lectures and exercises. The instruction will be in English if necessary.

## Forms of examination

a. Examination will be done by measuring the knowledge of the learning outcomes. Examination will

comprise written tests and written reports of group exercises.

b. Grading is done according to a 7-point scale related to the specified learning outcomes:

A = Excellent

B = Very Good

C = Good

D = Satisfactory

E = Sufficient

Fx = Insufficient

F = Completely insufficient

c. Grading criteria will be distributed at the beginning of the course.

d. To pass the entire course, a minimum grade of E for part 1 is required.

e. Students who have received the grade Fx or F on an examination are entitled to at least four additional examinations to achieve the lowest grade E as long as the course is given.

Students who have received the grade E on an examination may not retake this examination in order to attempt to achieve a higher grade.

Students who have received the grade Fx or F on an examination on two occasions by the same examiner have the right to request that a different examiner be appointed to set the grade of the examination. Such a request must be in writing and sent to the head of the department.

Here, the term examination denotes all compulsory elements of the course.

### **Interim**

Students can request examination in accordance with this syllabus up to three times during a period of two years after the course is no longer given. Such a request must be in writing and sent to the head of the department.

Here, the term examination denotes all compulsory elements of the course.

### **Limitations**

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### **Misc**

The course is mandatory in the Master programme in Statistics and the Master programme in Survey Methodology and Official Statistics but it can also be studied as an independent course.

Approved course in Probability Theory, advanced course, (ST4070) or Advanced Probability Theory, AN, (ST405A) can be credited to Probability Theory, AN, (ST701A).

### **Required reading**

The course literature is described in an appendix to the syllabus.