

## **MASM14, Mathematical Statistics: Mathematical Foundations of Probability, 7.5 credits**

*Matematisk statistik: Sannolikhhetsteorins matematiska grunder, 7,5  
höskolepoäng*  
Second Cycle / Avancerad nivå

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### **Details of approval**

The syllabus was approved by Study programmes board, Faculty of Science on 2007-01-31 and was last revised on 2007-01-31. The revised syllabus applies from 2007-07-01, autumn semester 2007.

### **General Information**

The course is an elective course for second-cycle studies for a Master of Science in Mathematical statistics.

*Language of instruction:* Swedish and English

<i>Main field of studies</i>	<i>Depth of study relative to the degree requirements</i>
Mathematics	A1N, Second cycle, has only first-cycle course/s as entry requirements
Mathematical Statistics	A1N, Second cycle, has only first-cycle course/s as entry requirements

### **Learning outcomes**

The aim of the course is that students on completion of the course should have acquired the following knowledge and skills:

#### **Knowledge and understanding**

On completion of the course, the students are expected to:

- be able to the measure theoretic approach to probabilities and random variables;
- be able to explain the construction of the Lebesgue-integral and the fundamental convergence theorem for this integral;

- be able to explain how the concepts conditional expectation and weak convergence can be formalized through measure theory.

### **Competence and skills**

On completion of the course, the students are expected to:

- be able to use the fundamental theorems in integration theory to solve problems;
- be able to choose an appropriate solution strategy for a problem within the course's range, and thereafter work out a detailed solution.

### **Course content**

The course deepens and extend basic knowledge in probability theory. Central part of the course is existence- and uniqueness theorems about measures defined on sigma-algebras, integration theory, conditional expectation and weak convergence in metric spaces.

### **Course design**

Teaching consists of lectures and exercises, which to a large extent is dependent on that the student actively participate. The students should therefore be prepared to be able to participate in discussions and problem solving.

### **Assessment**

The examination consists of a written exam followed by an oral exam. Students who fail the regular exam are offered a re-examination shortly afterwards.

*Subcourses that are part of this course can be found in an appendix at the end of this document.*

### **Grades**

Marking scale: Fail, Pass, Pass with distinction.

For a passing grade on the entire course a passing grade on the written and oral exam are required. The grade is formed by weighing together the results on the parts which are included the examination.

### **Entry requirements**

For admission to the course English B and knowledge equivalent to 60 credits in mathematics is required. The course MASC01 Probability Theory, 7.5 credits, is recommended.

## Subcourses in MASM14, Mathematical Statistics: Mathematical Foundations of Probability

Applies from H07

0701 Exam, 7,5 hp  
Grading scale: Fail, Pass, Pass with distinction