GÖTEBORG UNIVERSITY  
Faculty of Sciences 
Mathematical Sciences 

MSA150, Foundations of Probability Theory, 
7.5 credit points 

*Level: Advanced*

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1. **Authorization**
The course plan has been authorized by the vice-dean of the Department of Mathematical Sciences on November 9, 2006, to be valid from July 1, 2007.

*Educational field: Mathematical Sciences*

2. **Educational context**
The course is a part of the Master Program in Mathematical Sciences. It is also open for students outside the program who meet the course prerequisites.

3. **Prerequisites**
The student is supposed to have completed a course comprising a substantial part of basic probability theory, such as the course MSG100 at Göteborg University.

4. **Goals and learning outcomes**
After finishing the course, the student should
- have experienced the width of probability theory and its applications,
- have an advanced understanding of dependence and conditioning,
- a solid competence of carrying out probability calculations, often including use of transforms,
- have appreciated the role played by measures and Lebesgue integration in advanced probability theory.
5. Course description
The course comprises lectures, and classes with exercises and discussions. Probability theory is a rich and varied area of mathematics, with many applications; modern statistics is based on this theory. The purpose of this course is to study its foundations. Key words and phrases are: Basics, moments, independence and conditioning, the Strong law of large numbers, Transforms and the Central limit theorem, Random walk and the Markov property.

6. Literature
See separate list.

7. Assessment
The assessment is mainly based on a written final examination. There may also be compulsory home assignments.

8. Grades
The grade levels are Fail (U), Pass (G), and High Pass (VG). A wish for an ECTS grade should be reported to the examiner at the beginning of the course.

9. Course evaluation
In the middle and at the end of the course the teacher arranges an oral feedback discussion with the students. There may also be a questionnaire for the students to answer. The results of the questionnaire will be processed by the lecturer together with student representatives.

10. Additional information