



## DEPARTMENT OF MATHEMATICAL SCIENCES

### **MSF500 Weak Convergence, 7.5 higher education credits**

Svag konvergens, 7,5 högskolepoäng

*Second Cycle*

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#### **Confirmation**

The course syllabus was confirmed by Department of Mathematical Sciences on 2014-07-04 to be valid from 2014-07-04, autumn semester of 2014.

*Field of education:* Science 100%

*Department:* Department of Mathematical Sciences

#### **Position in the educational system**

The course is a specialization course in mathematical statistics in the master program in mathematical sciences.

The course is part of the following programme: 1) Mathematical Sciences, Master's Programme

*Main field of studies*

Mathematical Statistics

*Specialization*

A1F, Second cycle, has second-cycle course/s as entry requirements

#### **Entry requirements**

The prerequisite for the course is the equivalent of the courses MSA150 Foundations of probability theory and MMA110 Integration theory.

#### **Learning outcomes**

After having taken the course, one should be able to

- explain the details of the proofs of the main theorems given in the compendium,
- solve exercises given in the compendium,
- demonstrate understanding of the key concepts and ideas concerning the weak convergence of probability measures.

**Course content**

This course deals with weak convergence of probability measures on Polish spaces. Here the principal examples of Polish spaces are the space  $C = C[0, 1]$  of continuous trajectories and the space  $D = D[0, 1]$  of cadlag trajectories. Main topics:

- Portmanteau and mapping theorems
- Tightness and Prokhorov theorem
- Functional central limit theorems on  $C$  and  $D$
- Empirical distribution functions and the Brownian bridge
- Weak convergence on  $D[0, \infty)$

**Form of teaching**

The teaching is organized with lectures and reading assignments.

*Language of instruction:* English

**Assessment**

Oral and/or written examination.

**Grades**

The grading scale comprises: Pass with Distinction (VG), Pass (G) and Fail (U).

**Course evaluation**

Oral and/or written course evaluation will be performed. The results of the evaluation will be communicated to the students and will serve as a guide for the development of the course.