SF2971 Martingales and Stochastic Integrals 7.5 credits

Martingaler och stokastiska integraler

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

The course syllabus is valid from Spring 2022 according to the school principal's decision: S-2022-0529 Decision date: 2022-02-24

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Mathematics

Specific prerequisites

- English B / English 6
- Completed advanced course in probability theory (SF2940 or equivalent)

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After passing the course, the students should be able to

- formulate and explain central definitions and theorems within the theory of martingales and stochastic integrals;
- solve basic problems within the theory of martingales and stochastic integrals, and apply its methods to stochastic processes.

Course contents

- Conditional expectation, martingales and stochastic integrals in discrete time, stopping times, Girsanov Theorem.
- Martingales in continuous time, Brownian motion, Ito integral and Ito Lemma.
- Martingale representation Theorem, stochastic differential equations, Ito diffusions, Kolmogorov equations, Feynman-Kac formula, stopping times and optional stopping.

Examination

- TEN1 - Examination, 7.5 credits, grading scale: A, B, C, D, E, FX, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.