MASM12, Mathematical Statistics: Non-linear Time Series Analysis, 7.5 credits
Matematisk statistik: Olinjära tidsserier, 7,5 högskolepoäng
Second Cycle / Avancerad nivå

Details of approval
The syllabus was approved by Study programmes board, Faculty of Science on 2007-06-14 to be valid 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: English and Swedish

Main field of studies Depth of study relative to the degree requirements

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

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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 explain qualitative differences between linear and non-linear models,
- be able to distinguish between the properties of parametric and non-parametric models,
- understand stochastic filtering of latent processes using Kalman filters and particle filters,
- be able to apply methods useful when data is non-stationary.

Skills and abilities
On completion of the course, the students are expected to:
• be able to determine whether data needs to be modelled using a non-linear model,
• be able to fit a suitable model to data using different methods,
• be able to solve all the parts of a modelling problem using scientific, technical and statistical theory (from this course and other courses) where the solution includes model specification, inference and model choice,
• present the solution in a technical report.

Judgement and approach
On completion of the course, the students are expected to:
• be able to utilise scientific articles within the field and related fields.

Course design

Course implementation
Teaching consists of lectures, computer exercises and projects. Participation in project work, computer exercises and thereby integrated teaching is compulsory.

Assessment
The examination are done through written project reports and an oral presentation.

Subcourses
0701 Project, 7,5 hp Grading scale: Fail, Pass, Pass with distinction
0702 Computer Exercises, 0,0 hp Grading scale: Fail, Pass

Grades
For a passing grade on the entire course passed project reports, oral presentation and participation in compulsory parts is required. The final grade is the grade on the project.

Marking scale: Fail, Pass, Pass with distinction.

Entry requirements
For admission to the course knowledge equivalent to MASM17 Time series analysis, 7.5 credits is required together with English B.