SF2941 Probability Theory and Linear Models 7.5 credits

Sannolikhetsteori och linjära modeller

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

Establishment

Course syllabus for SF2941 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Specific prerequisites

Basic knowledge in Mathematical Statistics, Fourier Analysis and Linear Algebra.

Language of instruction

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

Intended learning outcomes

To pass the course, the student should be able to do the following:

- define and apply basic concepts and methods of probability theory
- use common probability distributions and analyse their properties (exponential distribution, multivariate normal distribution, etc.)
- compute conditional probability distributions and conditional expectations
- solve problems and compute limits of distributions by use of transforms (characteristic functions, probability generating functions,)
- formulate an adequate linear model on the basis of a given problem, such as testing a hypothesis,
- judiciously judge the validity of the specification of a linear model
- estimate the parameters of a linear model, interpret the results, and use the model for prediction and hypothesis testing.

To receive the highest grade, the student should in addition be able to do the following:

- Combine all the concepts and methods mentioned above in order to solve more complex problems.

Course contents

The basic concepts of probability theory. Characteristic functions and probability generating functions. Convergence of probability distributions, the Central Limit Theorem. Convergence of random variables. The Law of Large Numbers. Multivariate Normal distributions. Conditional distributions. Linear models and multivariate regression analysis.

Course literature

Will be determined later.

Examination

- PRO1 - Project, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 6.0 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.

Other requirements for final grade

A written examination (TEN1; 6 university credits),
a project task (PRO1; 1,5 university credits)

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.