



HF1012 Mathematical Statistics

6.0 credits

Matematisk statistik

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

Establishment

Course syllabus for HF1012 valid from Autumn 2011

Grading scale

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

Education cycle

First cycle

Main field of study

Specific prerequisites

Mathematics corresponding to Linear algebra and calculus in one variable.

Language of instruction

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

Intended learning outcomes

After completion of the course the student should be able to

- define and explain basic concepts in descriptive statistics and probability theory
- solve some standard problems that include standard discrete and continuous random distributions
- construct a confidence interval to estimate a population mean
- apply the central limit theorem
- find stationary probabilities for discrete and continuous-time Markov chains
- model simple M/M/m queueing systems and calculate theoretical quantities in these models

Course contents

- Statistics: Descriptive statistics.
- Sets and combinatorics. Probability theory, basic notations.
- Sample spaces, dependent and independent events. Conditional probability. The theorem of total probability.
- Stochastic variables. Expected value, variance and standard deviation.
- Discrete stochastic variables.
- Uniform, hypergeometric distribution.
- The binomial and Poisson distributions.
- Continuous random variables. Uniform distribution, exponential and normal distribution
- Functions of random variables. The central limit theorem.
- Point estimation and confidence intervals for means.
- Covariance, correlation, regression line
- Markov chains
- Introduction to M/M/m queueing systems

Examination

- TEN1 - Examination, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Lab Work, 2.0 credits, grading scale: P, 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.