SF1908 Mathematical Statistics, Basic Course 6.0 credits

Matematisk statistik, allmän kurs

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

Establishment

Course syllabus for SF1908 valid from Autumn 2007

Grading scale

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

Education cycle

First cycle

Main field of study

Technology

Specific prerequisites

Mathematical Methods II

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:

- construct elementary statistical models for experiments
- state standard models and explain the applicability of the models in given examples
- calculate descriptive quantities like expectation, variance, and percentiles for distributions and data sets and graphically present data sets
- with standard methods calculate estimates of unknown quantities and quantify the uncertainty in these estimates
- describe how measuring accuracy affect conclusions and quantify risks and error probabilities when testing statistical hypothesis
- perform simple computer simulations
- critically analyse statistical information and investigations
- give examples on public statistical production

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

Basic concepts like probabilities, conditional probabilities and independent events. Discrete and continuous random variables, especially one dimensional random variables. Measures of location, scale and dependency of random variables and data sets. Common distributions and models: normal, binomial and Poisson distribution. Central limit theorem and Law of large numbers.

Descriptive statistics. Graphical visualisation of data sets.

Point estimates and general methods of estimation as the method of maximum likelihood and least squares. General confidence intervals but specifically confidence intervals for mean and variance of normally distributed observations. Confidence intervals for proportions, difference in means and proportions.

Testing statistical hypothesis. Chi2-test of distribution, test of homogeneity and contigency. Linear regression.

Course literature

Blom et al: Sannolikhetslära och statistikteori med tillämpningar

Complemental material from the department.

Examination

- INL1 - Assignments, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 4.5 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.