IX1501 Mathematical Statistics 7.5 credits

Matematisk statistik

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

Establishment

Course syllabus for IX1501 valid from Autumn 2008

Grading scale

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

Education cycle

First cycle

Main field of study

Mathematics, Technology

Specific prerequisites

Entrance qualifications:

- IX1303 - Algebra och Geometry
- IX1304 - Calculus

Language of instruction

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

Intended learning outcomes

General Objectives

After course completion the student should be able to:

- formulate, analyze and solve problems in statistics significant to in the ICT sphere.
- apply and develop statistical models with the aid of mathematical programming language.
- review and comment a given solution to a problem.
- comment domain and propose improvements to a statistical model.
- make presentations of solutions of a statistical problem.

Detailed Objectives

After course completion the student should be able to:

- apply basic stochastic models and use these to determine summary measures and probabilies.
- use normal approximation according to CLT.
- apply basic statistical models to an experiment.
- specify a standard model and comment the fitness for given data.
- describe data with summary measures, such as mean, variance and covariance.
- present data graphically in a suitable way.
- compute point estimates and confidence intervals.
- estimate error risks in hypothesis testing.
- compute correlation and regression line.

Course contents

Probability theory: probability, conditional probability, independenceone-dimensional random variablesbriefing about multi-dimensional random variablescommon distributionsmeasures (location, spreading and dependence) Law of Large Numbers, Central Limit Theorem Statistics: point estimates, confidence intervalshypothesis testregression analysis, correlation, graphical presentation of data.

Disposition

The teaching method is problem oriented and computer aided. The education time is evenly distributed among the three main topics

- conceptual understanding and modelling
- algorithms
- conclusions and synthesis

Examination

- INL1 - Problem Assignments, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.5 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.

Other requirements for final grade

- Written exam (TEN1; 3,5 credits)
- Problem assignments (INL1; 4,0 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.