



IX1501 Mathematical Statistics

7.5 credits

Matematisk statistik

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

If the course is discontinued, students may request to be examined during the following two academic years

Establishment

Course syllabus for IX1501 valid from Autumn 2021

Grading scale

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

Education cycle

First cycle

Main field of study

Mathematics, Technology

Specific prerequisites

- Knowledge in algebra and geometry, 7,5 credits, corresponding to completed course IX1303.
- Knowledge in calculus, 7,5 credits, corresponding to completed course IX1304.

Active participation in a course offering where the final examination is not yet reported in Ladok is considered equivalent to completion of the course.

Registering for a course is counted as active participation.

The term 'final examination' encompasses both the regular examination and the first re-examination.

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 probabilities.
- 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.
- compute point estimates and confidence intervals.
- estimate error risks in hypothesis testing.

Course contents

Probability theory: probability, conditional probability, independence one-dimensional random variables briefing about multi-dimensional random variables common distributions-measures (location, spreading and dependence) Law of Large Numbers, Central Limit Theorem Statistics: point estimates, confidence interval hypothesis test regression analysis, correlation, graphical presentation of data.

Examination

- INLA - Assignment, 3.5 credits, grading scale: P, F
- TENA - Written exam, 4.0 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.

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.