Fundamental Statistical Methods

Single subject and programme course

6 credits

Statistiska grunder

732G37

Valid from:

Determined by
The Quality Board at the Faculty of Arts and Sciences

Date determined
2014-05-28

Main field of study
Statistics

Course level
First cycle

Advancement level
G1X

Entry requirements
For acceptance to the course, the student must have competed courses in calculus and linear algebra and a course/courses covering at least 4 ECTS in statistics. Documented knowledge of English equivalent to Engelska B/Engelska 6: internationally recognized test, e.g. TOEFL (minimum scores: Paper based 575 + TWE-score 4.5, and internet based 90+TWE-score 20), IELTS, academic (minimum score Overall band 6.5 and no band under 5.5), or equivalent.

Intended learning outcomes
Having completed the course, the student should be able to:
- use knowledge of the common statistical distributions for building statistical models.
- demonstrate a basic understanding of the main principles within point estimation, interval estimation and hypothesis testing,
- demonstrate a basic understanding of the main concepts of Bayesian analysis,
- build linear regression models, check their uncertainty and perform model comparison.

Course content
The course provides a theoretical basis of statistical concepts and methods that are required for using statistics in other applied areas.
- Concept of probability
- Random variable, common statistical distributions and their properties
- Point and interval estimation
- Hypothesis testing
- Simple and multiple linear regression, t-test and F-test. Residual and outlier analyses
- Likelihood, prior and posterior distribution, and Bayes theorem
- Concepts of Markov chains

Teaching and working methods

The teaching comprises lectures, seminars, and computer exercises complemented by self-studies. The lectures are devoted to presentations of concepts, theories and methods. The computer exercises provide practical experience of statistical analysis. The seminars comprise presentations and discussions of various assignments.

Examination

Written reports on the computer assignments. One final written examination. Detailed information about the examination can be found in the courses study guide.

Grades

ECTS, EC

Other information

Planning and implementation of a course must take its starting point in the wording of the syllabus. The course evaluation included in each course must therefore take up the question how well the course agrees with the syllabus. The course is carried out in such a way that both men´s and women´s experience and knowledge is made visible and developed.

Department

Institutionen för datavetenskap