Linnæus University

Course syllabus

Faculty of Technology

Department of Mathematics

1MA201 Sannolikhetslära och statistik, 7,5 högskolepoäng
1MA201 Probability Theory and Statistics, 7.5 credits

Main field of study
Mathematics

Subject Group
Mathematics

Level of classification
First Level

Progression
G1F

Date of Ratification
Approved 2009-12-01
Revised 2014-09-03 by Faculty of Technology. Objectives, content, examination and type of instructions are revised.
The course syllabus is valid from autumn semester 2015

Prerequisites
Calculus I 7.5 credits (1MA102).

Objectives
The student shall after the course is completed be able to:

- Describe the basic concepts in probability theory; in particular the notions constituting Kolmogorov's axioms and the notion of independence
- Distinguish between independent and uncorrelated random variables
- Account for and apply the Law of large numbers
- Account for the Central limit theorem and be able to apply the theorem
- Evaluate stochastic problems regarding a suitable distribution
- Understand and describe the basic concepts in statistics which are point estimates and statistical inference
- Interpret, communicate and discuss in probabilistic settings in particular solve assessment problems in small groups and present them to an auditorium.

Content
The course content comprises to:

Sample space, events, probability distribution, the notion of independence, conditional probability, discrete and continuous distributions, distributions functions, one and higher dimensional random variables, moments, moment generating and characteristic functions, conditional expectation, joint and marginal distributions, basic notions of convergence in probability theory, the Law of large numbers, the Central limit theorem, point estimates, confidence intervals, hypothesis testing.

Point estimates and statistical inference.

Type of Instruction
Lectures; computerbased laboration; oral presentation, written report and opposition of a project.

Examination
The course is assessed with the grades Fail (U), Pass (G) or Pass with Distinction (VG).

Assessment of how well the student fulfills the objectives is achieved through

- written exam
- written presentation of a computer based laboratory assignment
- project work that is accounted for by a written and oral presentation
- opposition of another student's project work

On request, students may have their credits translated to ECTS-marks. Such a request must be sent to the examiner before the grading process starts.

Course Evaluation
A course evaluation will be carried out and compiled after the course is completed. The compilation will be presented to the current board as well as to the students and filed.

Required Reading and Additional Study Material
Required reading
Papoulis, A. & Pillai, S.U., *Probability, random variables, and stochastic processes* McGraw-Hill, latest edition