SYLLABUS

Numerical Methods and Statistics 7.5 credits B0007M

Numeriska metoder och statistik

Course syllabus admitted: Autumn 2013 Sp 1 - Autumn 2014 Sp 2

DECISION DATE
2013-02-15

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LULEÅ TEKNISKA UNIVERSITET

Numerical Methods and Statistics 7.5 credits B0007M

Numeriska metoder och statistik

First cycle, B0007M

Education level	Grade scale	Subject	Subject group (SCB)
First cycle	G U 3 4 5	Matematik	Mathematics

Entry requirements

In order to meet the general entry requirements for first cycle studies you must have successfully completed upper secondary education and documented skills in English language and Mathematics Calculus B0004M, Undergraduate Level 1

Selection

The selection is based on 1-165 credits.

Examiner

Lars Bergström

Course Aim

The purpose of the course is to give basic knowledge of Statistics with emphasis on probability theory and statistical conclusion.

After completed course the student should be able to:
- know basic probability concepts
- distinguish some discrete as well as continuous distributions (e g binomial, Poisson, hyper-geometric and the normal distribution)
- calculate expected value and variance
- understand the significance of the central limit- theory
- decide if a point estimate is unbiased and if it is efficient (compared to another estimate)
- calculate a confidence-interval for one expected value as well as for the difference between two expected values
- calculate the confidence-interval for a proportion
- execute tests of hypotheses
- have good command of non-parametric methods such as sign-tests and Wilcoxons rank sum test
- understand how different numerical methods are constructed and how they are used
- be able to implement numerical algorithms in a programming language or a program for mathematical computations.

Contents

The probability concept, independent occurrences, conditional probabilities, stochastic variables, expected values, variance, some statistic standard-distributions and the central limit- theorem with applications
Estimation and testing of hypotheses, random values and simulation.
Numerical, iterative, solution of nonlinear equations, interpolation and curve fitting, numerical integration and numerical solution of ordinary differential equations.
Laboratory work with computer with statistical and/or mathematical software.

Realization

Each course occasion´s language and form is stated and appear on the course page on Luleå University of Technology's website.

Lectures, exercises and laboratory work.

Examination

If there is a decision on special educational support, in accordance with the Guideline Student's rights and obligations at Luleå University of Technology, an adapted or alternative form of examination can be provided.
Written exam and assignments

Literature. Valid from Autumn 2013 Sp 1

Vännman, K.. (2002) Matematisk statistik. 2 uppl. Lund : Studentlitteratur. (337 s). ISBN 91-44-01690-5
Papers which are provided by the The Swedish School of Mining and Metallurgy (Bergsskolan) in Filipstad.

Course offered by

Department of Engineering Sciences and Mathematics

Items/credits

No items/credits available

Syllabus established

by Mats Naesstroem 2013-02-15