Linnæus University

Course syllabus

Faculty Board of Science and Engineering

School of Computer Science, Physics and Mathematics

4ED000 Estimeringsteori, 7,5 högskolepoäng
4ED000 Estimation theory, 7.5 credits

Main field of study
Electrical Engineering

Subject Group
Electrical Engineering

Level of classification
Second Level

Progression
A1N

Date of Ratification
Approved 2009-08-11
Revised 2010-08-18 by School of Computer Science, Physics and Mathematics.
Revision made for English translation of the syllabus and course evaluation.
The course syllabus is valid from spring semester 2011

Prerequisites
Several variables and vector analysis 7.5 credits
Probability Theory, 7.5 credits or the equivalent.

Objectives
This course provides students with basic knowledge in statistical signal processing. After completing the course the student should:

- have received a basic understanding of statistical signal models and their application
- be able to analyze a given statistical model with respect to optimal limits
- have obtained a good knowledge of *linear estimation*
- have obtained experience on different kinds of statistical methods *Maximum-Likelihood-method* , *least-squares methods* ; *moment methods* and *Bayesian estimation* .

Content
The course covers the following topics:

- minimum variance unbiased estimators
- *Fisher information* and *Cramer-Rao* lower bound
- linear models
- Maximum Likelihood principle
- least squares methods
- moment methods
- Bayesian philosophy.

Type of Instruction

Lectures and exercises. Computer laborations.

Examination

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

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.
Assignments/written examination.
The current exam format is determined at the start of the course.

Course Evaluation

A course evaluation will be carried out at the end of the course in accordance with the guidelines of the University. The result of the course evaluation will be filed at the department.

Required Reading and Additional Study Material

Estimation theory

Steven M. Kay, *Fundamentals of Statistical Signal Processing, estimation theory*, Prentice Hall, 1993. ISBN:0-13-345711-7. 595 sidor.