



Course syllabus

Faculty of Technology

Department of Physics and Electrical Engineering

4ED300 Estimeringsteori, 7,5 högskolepoäng

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 by Faculty of Technology 2015-05-22

The course syllabus is valid from spring semester 2016

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 A, B, C, D, E, Fx or F.

The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

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

Course Evaluation

During the course or in close connection to the course, a course evaluation is to be carried out. The result and analysis of the course evaluation are to be communicated to the students who have taken the course and to the students who are to participate in the course the next time it is offered. The course evaluation is carried out anonymously. The compiled report will be filed at the Faculty.

Credit Overlap

This course cannot be part of a degree in combination with another course in which the content fully or partly correspond to the content of this course: 4ED000 Estimation theory, 7.5 credits

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

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.