



EQ2810 Estimation Theory, Accelerated Program Course 6.0 credits

Estimeringsteori, forskarförberedande

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

For single course students: 180 credits and documented proficiency in English B or equivalent

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

This is an introductory course to statistical estimation theory given from a signal processing perspective. The aim is to provide the basic principles and tools which are useful to solve many estimation problems in signal processing and communications. It will also serve as the necessary prerequisite for more advanced texts and research papers in the area. The course will cover fundamental concepts such as sufficient statistics, the Rao-Blackwell theorem and the Cramer-Rao lower bound on estimation accuracy. Furthermore, the most common estimation methods are treated, including maximum likelihood, least-squares, minimum variance, method of moments and Bayesian estimation. The course assumes some familiarity with basic matrix theory and statistics.

Course contents

Introduction, minimum variance estimation, Cramer-Rao bound. General minimum variance and best linear unbiased estimation. Maximum likelihood estimation, least squares, method of moments, Bayesian estimation. Extensions for complex data and parameters.

Course literature

"Fundamentals of Statistical Signal Processing: Estimation Theory," Kay, Steven M. ISBN 0133457117.

Examination

- TEN1 - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

Other requirements for final grade

Attending the lectures is mandatory

Homework assignments oral examination (not required if the homeworks are correct)
project assignment.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.