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

Knowledge in linear algebra, 7.5 higher education credits, equivalent to completed course SF1624/SF1672/SF1684.

Knowledge in probability theory and statistics, 6 credits, equivalent to completed course SF1910/SF1924/SF1935.

Language of instruction

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

Intended learning outcomes

After passing the course, the student should be able to:

– explain the difference between classical and Bayesian estimation

– describe concepts such as unbiased estimator, estimator variance and efficiency

– explain the concept of sufficient statistics and its importance for minimum variance estimation

– formulate system models and parameter estimation problems and derive corresponding Cramér-Rao bounds and sufficient statistics

– apply appropriate estimators (including linear, least-squares, maximum likelihood, method of moments, and maximum a posteriori) after taking into account estimation accuracy and complexity

– work with both real and complex valued data

– reflect on sustainability, equity and ethical issues related to the course content and its use.

Course contents

The course covers the following fields:

– minimum variance estimation

– Cramér-Rao bound

– best linear unbiased estimation

– maximum likelihood estimation

– least squares method

– the method of moments

– Bayesian estimation

– extensions for complex data and parameters.

Examination

- PROA - Project assignment, 1.5 credits, grading scale: A, B, C, D, E, FX, F

- INLA - Homework, 3.5 credits, grading scale: A, B, C, D, E, FX, F
- TENA - Written exam, 1.0 credits, grading scale: A, B, C, D, E, FX, 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.

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.