FEL3201 Data-Driven Modeling, Basic Course 8.0 credits

Datadriven modellering, grundläggande kurs

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

Establishment

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Language of instruction

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

Intended learning outcomes

After the course, the student should be able to:

· describe the general principles for system identification.

· identify systems in a satisfactory manner. This includes choice of excitation signals, model structure and estimation algorithm as well as proper use of model validation.

·   analyse basic model properties, such as identifiability and accuracy (bias and variance errors).

Course contents

Signal spectra, linear time-invariant sytems, prediction and filtering, linear and non-linear models, identifiability, non-parametric methods, parameter estimation, maximum likelihood estimation, linear regression, least-squares estimation, the prediction error method, the instrumental variable method, subspace identification, kernel methods, support vector machines, convergence and consistency, modeling accuracy, Cramér-Rao lower bound, numerical optimization, recursive estimation, bias and variance errors, experiment design, applications oriented system identification, choice of identification criterion, model validation, model structure selection, system identification in practice.

Examination

 • EXA1 - Examination, 8.0 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

·   15 min oral presentation of a selected topic in one of the lectures

·   80% on weekly home-work problems

·   project (preferably on a problem related to the student's own research)

·   50 % on 72 h take home exam

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.