



# FEI3250 Electrotechnical Modeling, PhD Course 8.0 credits

Elektroteknisk modellering, doktorandkurs

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

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

## Establishment

Course syllabus for FEI3250 valid from Autumn 2011

## Grading scale

## 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 basic modelling approaches applicable within electrotechnology

- by use of electrotechnical models foresee the function of electrotechnical equipment
- by use of electrotechnical models analyse the properties of electrotechnical apparatus,
- assess the applicability of a given electrotechnical model.
- contribute to the research frontier in the area

## Course contents

The FEM method and the basics of numerical analysis, multiphysical FEM, FEM with coupled circuitry, FEM with changing geometry – moving boundaries, FEM and inverse problems - line Integrals - integral Equations - and integro-differential equations, magnetic hysteresis modeling, lumped element modeling, multiphysical lumped element modeling, nonlinear dynamics and linear system analysis

## Disposition

Introductory lectures, self studies, project task, report writing and presentation.

## Course literature

W. B. J. Zimmerman: Multiphysics Modeling with Finite Element Methods, World Scientific Publishing Co. 2006, ISBN: 978-981-256-843-4

## Examination

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.

## Other requirements for final grade

- approved written report on a chosen modeling task
- 25 min oral presentation of the written report

## 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.

