



# FEI3353 Electrotechnical Design, Ph D. Course 10.0 credits

Elektroteknisk konstruktion, 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 FEI3353 valid from Spring 2013

## Grading scale

## Education cycle

Third cycle

## Specific prerequisites

The participant must be a registered PhD student in the program of Electrical Engineering

## Language of instruction

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

## Intended learning outcomes

After completing the course, course participants will be able to

- describe the function of some electrical components and function and the properties of the - included magnetic, dielectric and conductor materials,
- describe and explain how electric and magnetic fields affect the operation of electrical equipment,
- use analytical methods, dynamic simulation and the finite element method for the design of electrical equipment.

## Course contents

Basic principles, issues, methods, and tools for the design of electrical systems that includes, electric and magnetic fields, electric and magnetic materials, mechanical and thermal system, and multiphysical systems.

Most of the course is focused on the implementation of design tasks that includes the methodology for problem formulation and presentation of model algorithms, use of finite element software, and dynamic simulation. The design objects can be an electromechanical actuator, magnetic device as a transformer, a loudspeaker and/or a high voltage device as a HV cable, bushing and/or cable termination, where electrical, magnetic, thermal and mechanical aspects has to be accounted for. The design tasks that will be performed are decided by the course examiner.

## Disposition

Lectures, self studies, Seminars, software exercises, project work, presentation of project, written report

## Course literature

G. Engdahl: Electrotechnical modeling and design

Handbooks

## 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

- Written examination
- Oral presentation at a seminar at KTH or at a conference/symposium outside KTH
- Approved project report

The project report should comprise background, and introduction of a selected design problem, description of the approach to manage the problem, the carrying out, results, assessment of the result, and a conclusion regarding the obtained results.

## **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.