EL2430 High-voltage Engineering 7.5 credits

Högspänningsteknik

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 EL2430 valid from Spring 2019

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

Education cycle
Second cycle

Main field of study
Electrical Engineering

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

Intended learning outcomes
The course is an advanced course on high-voltage technology and electrical insulating materials.

Aim

When the students have passed the course, they shall be able to
- describe the principles behind generating high DC-, AC- and impulse voltages
- develop equivalent circuit models of the different high voltage generators
- perform a dynamic response analysis of high voltage measurement systems
- compute the breakdown strength of gas-filled insulation systems with simple geometries
- approximately judge the breakdown strength of contaminated liquids and solids.
- describe the principles for measurement of capacitance and dielectric loss
- discuss ageing of electrical insulation from measurements of complex permittivity
- compute the complex permittivity from the dielectric response function and vice versa.
- discuss the measurement principles behind partial discharges
- compute phase resolved partial discharge patterns from simple models

Course contents

The course contains the basic theories and the most important experimental methods of high voltage engineering.


Two projects are included that treats measurements of high voltages and diagnostics of electrical insulation. Three laboratory exercises are included plus experimental tasks in the projects. Three non-compulsory assignments treat the theoretical aspects. Two study tours are usually offered. In the end of the course there is a written exam.

Exercises:

Problem solving related to the various parts of the course.

Specific prerequisites

150 university credits (hp) in engineering or natural sciences and documented proficiency in English corresponding to English B.
Course literature
Valda publikationer.
Beskrivning av projektuppgifter.
Föreläsningsanteckningar

Examination
• LABA - Laborations and projects, 3.8 credits, grading scale: P, F
• TENA - Examination, 3.7 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.

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.