FEI3370 Electrical Discharges in Gases and their Applications, PhD Course 8.0 credits

Elektriska urladdningar i gaser och deras tillämpningar, doktorandkurs

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

Establishment

Course syllabus for FEI3370 valid from Spring 2019

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 completion of the course, the student should be able to:

- Explain the fundamental physical processes and the major mechanisms leading to electrical discharges in gases
- Compare the different types of thermal (arcs, leader discharges, plasmas) and non-thermal discharges (glow, corona streamers, avalanches, dielectric barrier discharges), their types and features
- Analyse and interpret the electrical, chemical and optical measurements of electrical discharges in the laboratory
- Perform electric field calculations and use basic criteria for the evaluation of breakdown in gases
- Compare the different numerical techniques used to simulate electrical discharges in gases, identify their limitations and choose properly the processes that can be simulated with them.
- Develop a simple computer model to simulate electrical discharges in a specific application of interest for the student.

Course contents

Physics of electrical discharges in gases and their application, including theory, simulation and measurements

Disposition

Lessons 30 h

Equipment

High voltage laboratory, electrical switching laboratory

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

Written examination, a simulation exercise and laboratory reports. Oral presentation of one subject.

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.