



Course syllabus

Faculty of Technology

Department of Physics and Electrical Engineering

4ED453 Elkraft och smarta nät, 7,5 högskolepoäng

4ED453 Electric Power and Smart Grid, 7.5 credits

Main field of study

Energy Technology, Electrical Engineering

Subject Group

Electrical Engineering

Level of classification

Second Level

Progression

A1N

Date of Ratification

Approved 2015-04-28

Revised 2023-02-27 by Faculty of Technology. Examination is revised.

The course syllabus is valid from autumn semester 2023

Prerequisites

Bachelor Degree in Engineering/Science/Technology including Electric power systems, 7.5 hp or Radio engineering, 7.5 credits or equivalent, English B/ English 6 or equivalent

Objectives

After completing the course the student should:

- Critically evaluate HVDC and HVAC systems and value their properties and limitations.
- Value different solutions for the electric grid and storage of electricity, and value terms such as voltage and frequency quality.
- Be able to critically assess scientific papers on the electric grid and smart grid developments.

Content

The course covers the following topics:

- HVAC and HVDC systems, cables, defects
- Quality in the power grid - load, voltage and frequency

- Storage
- Smart grid system

Type of Instruction

The teaching consists of lectures and self study. During the course, two reports shall be written by the students.

Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.

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The course is examined by oral exam and the assessment of two reports.

Repeat examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University.

If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customised exam or to have the student conduct the exam in an alternative way.

Course Evaluation

During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

Other

Grade criteria for the A–F scale are communicated to the student through a special document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Some elements of the course may incur costs that are to be paid by the course participant.

Required Reading and Additional Study Material

N. Mohan, Electric Power Systems - a first course. Wiley & sons, 2012. ISBN : 978-1-118-07479-4. Pages: 256.

S.F. Bush, Smart Grid: Communication-enabled Intelligence for the Electric Power Grid. Wiley - IEEE, 2014. ISBN-13: 978-1119975809. Pages: 570.

Other reading materials

Handouts, 50 pages.

At least two relevant scientific papers