EG110V Sustainable Electric Power Systems 7.5 credits

Uthålliga elkraftsystem

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

On 25/01/2022, the Head of the EECS School has decided to establish this official course syllabus to apply from autumn semester 2022, registration number J-2022-0189.

Grading scale

P, F

Education cycle

First cycle

Main field of study

Electrical Engineering

Specific prerequisites

Documented knowledge in basic mathematics and statistics, 5 ECTS-credits.

The upper secondary course English B/6.

Language of instruction

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

Intended learning outcomes

After passing the course, the student shall be able to

- describe conceptually the technical basic properties and the performance of the electric power system with main function to deliver electricity between production, consumption and storing
- carry out basic modelling and analysis of electric circuits
- describe the basics of synchronous generators
- describe the basics of the three phase transmission system
- carry out calculations per unit in the electric power system
- describe the basic impact of different power loads on the electric power system
- formulate and solve current flow analysis problem
- describe the basic behaviour of the electric power system based on simulation tools
- reason about and give examples of how an electric power system can be developed with the aim of contributing to a sustainable society.

Course contents

The course is divided into four parts as follows:

- Introduction with course information and presentation of the electric power system as a part of a sustainable energy system.
- Basic modelling and analysis of the electric power systems: from physics of electricity, basic circuit analysis to modelling of AC systems to power flow assessment.
- Studies of the performance of the power system including aspect of; new development with e.g. integration about renewable energy, operation and stability and market.
- Conclusion with course summary..

There are two laboratory items in the course:

1. Experimental lab which gives an introduction to electric circuits.
2. Computer lab that deals with simulation of the electric power system and handling of stability. PowerWorld Simulator will be used.

Before experimental lab is carried out, the safety instructions must be read, be understood and the course for working in the lab must be passed. For each lab. should a laboratory report be submitted and be approved.

Examination

- LAB1 - Laboratory work, 2.0 credits, grading scale: P, F
- LAB2 - Computer assignment, 2.5 credits, grading scale: P, F
- TENA - Oral exam, 3.0 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.

Transitional regulations

TEN1 is replaced by TENA.

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.