EJ1200 Electric Power Systems 6.0 credits

Eleffektsystem

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

Establishment

On 04/21/2020, the Head of the EECS School has decided to establish this official course syllabus to apply from autumn semester 2020, registration number: J-2020-0557.

Grading scale

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

Education cycle

First cycle

Main field of study

Electrical Engineering, Technology

Specific prerequisites

Completed course corresponding to EI1110 Electrical circuit analysis, extended course.

Active participation in a course offering where the final examination is not yet reported in LADOK is considered equivalent to completion of the course. This applies only to students who are first-time registered for the prerequisite course offering or have both that and the applied-for course offering in their individual study plan.

Language of instruction

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

Intended learning outcomes

On completion of the course, the student should:

- be able to describe the meaning of active, reactive and apparent power.
- be able to calculate mean values, peak values, rms-values, and harmonics.
- be able to analyse three-phase systems by means of single phase equivalent circuits, phasor diagrams and the jw-method.
- be able to describe different types of nodes in an electric power system.
- be able to make calculations on magnetic circuits.
- be able to calculate magnetic forces by means of the magnetic force law, virtual work and Maxwell's tensions.
- be able to describe rotating magnetic fields.
- be able to describe the function of the transformer, transmission lines, the synchronous machine, one- and three-phase power electronic converters.
- by using the jw-method, equivalent circuits and phasor diagrams be able to analyse transformers, transmission lines, synchronous machines, and one- and three-phase power electronic converters.
- be able to calculate power flows in the power system.

Course contents

Basic concepts and problems. Single-phase and three-phase power. Transmission line models. Transmission of power. Ferromagnetic circuits. The transformer. Magnetic forces. The synchronous machine. Single-phase and three-phase power electronic inverters. Electrical drives.

Examination

- LABD - Laboratory work, 0.5 credits, grading scale: P, F
- LABE - Laboratory work, 0.5 credits, grading scale: P, F
- LABF - Laboratory work, 0.5 credits, grading scale: P, F
- TEN2 - Written exam, 4.5 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.

If the course is discontinued, students may request to be examined during the following two academic years.

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.