EJ2201 Electrical Machines and Drives 6.0 credits

Elektriska maskiner och drivsystem

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

Establishment

On 10/13/2020, the Head of the EECS School has decided to establish this official course syllabus to apply from autumn semester 2021, registration number J-2021-0252.

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Knowledge in Electric Power Systems, 6 higher education credits, equivalent completed course EJ1200.

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 the basic principles of electromechanical conversion
- explain the principles of rotating magnetic field generation through the construction of AC windings
- explain the operating principles of DC machines, synchronous machines and induction machines
- use analytical models for describing the operation of DC machines, synchronous machines and induction machines
- use the space vector theory and the reference frame theory to describe the operation of AC machines
- describe the most important parts of a DC electric drive and a three-phase electric drive.

Course contents

- Electromagnetism and electromechanical models with application to rotating electric machines
- Principles of electromechanical energy conversion.
- Dc machines and their electric drive system.
- Rotating magnetic fields and AC windings.
- The space vectors and the dq0 reference frame.
- Operating principles for synchronous machines.
- Operating principles for asynchronous machines.
- Introduction to three-phase electric drive systems.

Examination

- LAB2 - Laboratory work, 0.5 credits, grading scale: P, F
- PROA - Project work, 5.5 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.

Transitional regulations

The earlier assessing items were LAB1 (0.5 higher education credits, P/F), PRO1 (1.5 higher education credits, P/F) and TEN1 (4.0 higher education credits, A-F). Students who have not completed the course with the earlier examination should follow the new examination

rules. However, final mark and course credits are given for TEN1 and PRO1 if a Pass grade is received from the new examination PROA.

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.