EJ2201 Electrical Machines and Drives 6.0 credits

Elektriska maskiner och drivsystem

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

Course syllabus for EJ2201 valid from Spring 2019

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Knowledge comparable to EJ1200 Electric Power Systems.

English B or equivalent.

Language of instruction

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

Intended learning outcomes

After completing the course, the student should be able to:

- Describe the fundamental parts of electrical drives including converter, electrical machine and load.
- Explain the operating principles of induction machines, synchronous machines and dc machines
- Identify parameters in models of electrical machines
- Use equivalent circuits to analyze electrical machines in steady state
- Construct phasor diagrams for different loads and to use the vector method for analysis of AC machines
- Describe the design of a simple three-phase ac winding and explain the concepts of pole number and winding factor
- Explain the background to voltage harmonics and estimate their influence on e.g. losses in electrical machines
- Use dynamic simulation software to analyze vector control of induction motors.

Course contents

Induction machines, synchronous machines, DC machines, salient poles, time harmonics, models for electrical machines under steady state and transient conditions, vector representation of AC machines, control of torque, speed and position for variable-speed AC and DC motor drives

Disposition

- Lectures 30 hours
- Tutorials 20 hours
- Laboratories 8 hours
- Project

Course literature

Compendium Electrical Machines and Drives EJ2201 KTH (in Englsih).

Examination

- LAB1 - Laboratory Work, 0.5 credits, grading scale: P, F
- PRO1 - Project Work, 1.5 credits, grading scale: P, F

- TEN1 - Written Exam, 4.0 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.

The grading of the course (A/F) is given by the grading at the written examination (TEN1).

Other requirements for final grade

Every examination part passed (LAB1, PRO1, and TEN1).

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.