



# EJ2200 Electrical Machines and Drives 7.5 credits

Elektriska maskiner och drivsystem

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

## Establishment

Course syllabus for EJ2200 valid from Autumn 2010

## Grading scale

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

## Education cycle

Second cycle

## Main field of study

Electrical Engineering

## Specific prerequisites

Completed Bachelor's degree (180 higher education credits), or equivalent academic qualifications. Documented proficiency in English corresponding to English B.

## Language of instruction

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

# Intended learning outcomes

After 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
- Explain the presence of airgap space harmonics in electrical machines and describe their influence on the behaviour of the machine
- Use dynamic simulation software to analyze vector control of induction motors.

## Course contents

Asynchronous, Synchronous and DC machines. Salient poles, harmonics and space 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

## Course literature

Electrical Machines and Drives KTH 2010

## Examination

- TENA - Examination, 4.5 credits, grading scale: A, B, C, D, E, FX, F
- LAB1 - Laboratory Work, 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.

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

## Other requirements for final grade

Written exam, two laboratory works one project assignement

## 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.