EJ2201 Electrical Machines and Drives 6.0 credits

Elektriska maskiner och drivsystem

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

Establishment

Course syllabus for EJ2201 valid from Autumn 2019

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

Completed course EJ1200 Electric power systems, or the equivalent.

Language of instruction

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

Intended learning outcomes

Having passed the course, the student shall be able to:
• describe the basic principles of electromechanical conversion
• explain the principles of rotating magnetic field generation through 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

• physics of electromagnetism and electromechanical models applied to rotating electrical machines.
• principles of electromechanical energy conversion
• dc machines and drive systems
• rotating magnetic fields and ac windings
• space vector representation and reference frames
• operating principles of synchronous machines
• operating principles of induction (asynchronous) machines
• introduction to non-conventional electrical machines
• introduction to to three-phase drives.

Course literature

P. Krause, O. Wasynczuk, S. D. Sudhoff, S. Pekarek, "Analysis of Electric Machinery and Drive Systems", Wiley-IEEE Press, 2013.

Examination

- 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
- LAB1 - Laboratory Work, 0.5 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.

The final grade of the course is given by the grade of the written examination (TEN1).

In agreement with KTH's coordinator for disabilities, it is the examiner who decides to adapt an examination for students in possession of a valid medical certificate.. The examiner may permit other examination formats at the re-examination of individual students.

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.