

Electrical Machines and Drives

Code: MFVGH31R02-EN

ECTS Credit Points: 2

Evaluation: exam

Year, Semester: 3rd year/2nd semester

Number of teaching hours/week:

Lecture: **2**

Practice: **1**

Prerequisites: MFPRL31R04-EN Programmable Logic Controllers I.

Topics:

The classification of electric energy converters. DC machines: structure, operation, mechanical and electronic commutators. Transformers: working principle, induced voltage, open circuit, short circuit and load conditions. Special transformers; three-phase transformers, measurement transformers (VT and CT). The rotating-field Theory and its applications. Synchronous machines: a three-phase cylindrical rotor synchronous machine structure and its working principle. Three-phase asynchronous machines: architecture and design principles and operation. Stepper motors, special electric machines. Rectifier bridge circuits, PWM drives, frequency converters.

Literature:

Electric Machines and Drives; Edited by Miroslav Chomat, ISBN 978-953-307-548-8

Schedule

1st week: Lecture: Classification of electrical energy converters Practice: 2nd week: Lecture: DC Motors: structures, mechanical and electronic commutators Practice: 3rd week: DC Motors: operation Lecture: Practice: 4th week: Lecture: Transformers: operating principles, induced voltage, open circuit, short circuit and load conditions Practice: 5th week: Lecture: 3Phase transformers Practice: 6th week: Lecture: The basics of rotating field theory and its applications Practice:	8th week: Mid-term test Lecture: Practice: 9th week: Lecture: Three-phase asynchronous machines: structures and working principles of an induction motor Practice: 10th week: Lecture: Three-phase asynchronous machines: operation Practice: 11th week: Lecture: stepper motors Practice: 12th week: Lecture: Special electric machines Practice: 13th week: Lecture: Rectifier circuits, rectifier bridges Practice:
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7th week: Lecture: Synchronous Machines: Construction and principles of operation of a three-phase cylindrical rotor synchronous machine	14th week: End-term test
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Requirements

A, for a signature:

Attendance at **lectures** is recommended, but not compulsory.

Participation at **practice classes** is compulsory. Students must attend the practice classes and may not miss more than three practice classes during the semester. In case a student does so, the subject will not be signed and the student must repeat the course. Student can't make up a practice class with another group. Attendance at practice will be recorded by the practice leader. Being late is counted as an absence. In case of further absences, a medical certificate needs to be presented. Missed practices should be made up for at a later date, being discussed with the tutor. Students are required to bring the necessary utensils (e.g. calculator) for the course to each practice class. Active participation is evaluated by the teacher in every class. If a student's behavior or conduct doesn't meet the requirements of active participation, the teacher may evaluate his/her participation as an absence due to the lack of active participation in class.

During the semester there are two tests: the mid-term test in the 8th week and the end-term test in the 15th week. Students have to sit for the tests.

B, for a grade (ESE):

The course ends in an **exam**, the grade is calculated as:

- 60% from the exam
- 20%-20% from the two tests

The minimum requirement for passing is 60%, the grade for the final mark is given according to the following table:

Score	Grade
0-59	fail (1)
60-69	pass (2)
70-79	satisfactory (3)
80-89	good (4)
90-100	excellent (5)

If the score of any test is below 60, the student once can take a retake test covering the whole semester material.