Electrical Engineering

Programme course

6 credits

Elkraftteknik

TSFS14

Valid from: 2021 Spring semester

Determined by
Board of Studies for Mechanical Engineering and Design

Date determined
2020-09-29

Main field of study
Electrical Engineering, Mechanical Engineering

Course level
First cycle

Advancement level
G2X

Course offered for
- Bachelor of Science in Mechanical Engineering
- Bachelor of Science in Engineering Electronics

Prerequisites
Electric Circuit Theory.

Intended learning outcomes
To give knowledge about the design and use of electrical power equipment used in mechanical engineering. In the end of the course the student should know about how to:

- perform calculations on symmetrical and unsymmetrical three phase systems
- perform calculations on three phase transfomer and draw complex circuits per phase
- understand the princip function and perform calculations on the DC-machine
- understand the princip function and perform calculations of the asynchronous machine
- perform calculations and phase control of inductive loads with capacitors in Y-or D connected
- perform calculations in power electronics with thyristors and diodes and rectifier AC-current with two-three and sexpuls bridges

As sub elements the student should know how to:

- understand the princip function and perform calculations in speed control of the DC-machine
- understand the princip function and perform calculations in speed control of the asynchronous machine
- understand the princip function of the synchronous machine
- understand and know personal danger in electrical systems

Course content

- three-phase systems
- three-phase transformer
- three-phase power distribution
- DC-machine
- asynchronous machine
- speed control of DC and AC- machine
- synchronous machine
- phase control of reactive loads
- AC/DC-conversion
- personal danger

Teaching and working methods

Lectures, exercises and laboratory work.

Examination

LAB1	Laboratory work	2 credits	U, G
TEN1	Written examination	4 credits	U, 3, 4, 5

Grades

Four-grade scale, LiU, U, 3, 4, 5

Other information

About teaching and examination language

The teaching language is presented in the Overview tab for each course. The examination language relates to the teaching language as follows:

- If teaching language is Swedish, the course as a whole or in large parts, is taught in Swedish. Please note that although teaching language is Swedish, parts of the course could be given in English. Examination language is Swedish.
- If teaching language is Swedish/English, the course as a whole will be taught in English if students without prior knowledge of the Swedish language participate. Examination language is Swedish or English (depending on teaching language).
- If teaching language is English, the course as a whole is taught in English. Examination language is English.

Other

The course is conducted in a manner where both men's and women's experience and knowledge are made visible and developed.

The planning and implementation of a course should correspond to the course syllabus. The course evaluation should therefore be conducted with the course syllabus as a starting point.

Department

Institutionen för systemteknik

Director of Studies or equivalent

Johan Löfberg

Examiner

Christofer Sundström

Course website and other links

http://www.fs.isy.liu.se/Edu/Courses/TMEI01

Education components

Preliminary scheduled hours: 54 h
Recommended self-study hours: 106 h

Course literature

T. Franzen, S. Lundgren Elkraftteknik. Studentlitteratur. ISBN 91-44-01804-5 .
Kompletterande material (laborationshandledningar mm).