Faculty of Health, Science and Technology
Electrical Engineering

Syllabus

Electrical Engineering for Master Students

Course Code:	ELGB13
Course Title:	Electrical Engineering for Master Students *Elteknik för civilingenjörer*
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has less than 60 credits in first-cycle course/s as entry requirements (G1F)

Major Field of Study:
ETA (Electrical Engineering)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2018-02-07, and is valid from the Autumn semester 2018 at Karlstad University.

Prerequisites
Linear Algebra 7.5 ECTS cr, or equivalent

Learning Outcomes
Upon completion of the course, students should be able to:
- perform calculations on simple electric nets by using Ohm's law, Kirchoff's laws and Thevenin's theorem,
- perform calculations on single-phase and three-phase alternating current circuits by using phasors and the j omega method,
- perform calculations on transformers, direct current machines and three-phase asynchronous machines,
- give an account of the three-phase synchronous machine
- perform calculations on simple semi-conductor circuits.

Content
The course comprises the following areas:
Electric circuits: calculations with Ohm's and Kirchoff's laws of series and parallel circuits, Thevenin's theorem
Single-phase and three-phase alternating current circuits: definition of sinusoidal voltage and currents, the use of phasors and the j omega method, Y- and D-connected three-phase systems
Power: active, reactive and apparent power, phase compensation
Transformer: windings, voltage, current ratio, transformer formula
Asynkronmaskinen: construction, moment, rotational speed, slip, loss and efficiency, Y/D-connected machine

Synchronous machines: construction, moment, rotational speed, loss and efficiency
Direct current machine: construction, separate and series excitation machine, rotational speed, loss and efficiency
Semi conductor and rectifier: semi conductor of n-type and p-type, diode, simple semi conductor circuits.

Reading List
See separate document.

Examination
Assessment is based on a written exam, hand-in assignments, mandatory laboratory sessions and lab reports.

Grades
One of the grades Pass with Distinction (5) Pass with Some Distinction (4), Pass (3) or Fail (U) is awarded in the examination of the course. Engineering students are awarded on of the grades Pass with Distinction (5), Pass with Some Distinction (4), Pass (G), or Fail (U).

Quality Assurance
Follow-up relating to learning conditions and goal-fulfilment takes place both during and upon completion of the course in order to ensure continuous improvement. Course evaluation is partly based on student views and experiences obtained in accordance with current regulations and partly on other data and documentation. Students will be informed of the result of the evaluation and of any measures to be taken.

Course Certificate
A course certificate will be provided upon request.

Additional information
The local regulations for studies at the Bachelor and Master levels at Karlstad University stipulate the obligations and rights of students and staff.