



Faculty of Health, Science and Technology
Electrical Engineering

Syllabus

Electrical technology

Course Code:	ELGA21
Course Title:	Electrical technology <i>Elteknik</i>
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 2018-02-08, and is valid from the Autumn semester 2018 at Karlstad University.

Prerequisites

Mathematics for engineers I, 7.5 ECTS cr or admission to the programme TGHMT or TGHID, or equivalent.

Learning Outcomes

Upon completion of the course, students should be able to:

- perform calculations of simple electrical nets using Ohm's law, Kirchoff's laws and Thévenin's theorem
- perform calculations of single-phase and three-phase alternating current circuits using phasor diagrams 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, the servo-motor and the stepper motor

Content

The course deals with the following components:

Electrical circuits: calculation with Ohm's and Kirchoff's laws of series and parallel circuits, Thevenin's theorem

Single and three-phase alternating currents: definitions of sinusoidal voltage and currents, using phasor diagram and the j-omega method, Y- and D-connected three-phase systems

Power: active, reactive and apparent power, phase compensation

Transformer: windings-, voltage- and current ratio, transformer formula

Non-synchronous machine: design, moment, rotational speed, slip, loss and efficiency, Y and D connected machine, frequency regulation

Synchronous machine, servo-motor, stepping motor: design, function and application areas
Direct current machine: design, separate and series magnetized machine, moment, rotational speed, loss and efficiency.

Reading List

See separate document.

Examination

Assessment is in the form of a written exam, hand-in assignments, mandatory laboratory sessions and lab reports.

Grades

One of the grades Pass with Distinction (5), Pass not without Distinction (4), Pass (3) or Fail (U) is awarded in the examination of the course.

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.