Reg No: ELGC25/20222

Faculty of Health, Science and Technology
Electrical Engineering

Syllabus

Electrical Power Systems

Course Code:	ELGC25
Course Title:	Electrical Power Systems *Elkraftsystem*
Credits:	7.5
Degree Level:	Undergraduate level
Progressive Specialisation:	First cycle, has at least 60 credits in first-cycle course/s as entry requirements (G2F)

Major Field of Study:
ETA (Electrical Engineering)

Course Approval
The syllabus was approved by the Faculty of Health, Science and Technology 2022-01-31, and is valid from the Autumn semester 2022 at Karlstad University.

Prerequisites
Introduction to Electrical Power Systems (7.5 ECTS credits) and Electrical machines (7.5 ECTS credits), or registered in the Electrical Engineering Master Programme, or equivalent

Learning Outcomes
Upon completion of the course, students should be able to perform calculations on:
- power flows in electrical power systems,
- symmetrical faults in electrical power systems,
- symmetrical components,
- asymmetrical faults in electrical power systems, and
- electrical power distribution.

Content
- Power flows in electrical power systems: Problem formulations related to power flows,

solutions techniques, and solutions based on software
- Symmetrical faults: Three-phase short circuit, impedance matrix for electrical power systems
- Symmetrical components: Definition, sequence networks for components in electrical power systems, per-unit models
- Asymmetrical faults: One-phase short circuit, two-phase short circuit, two-phase ground fault
- Distribution: Primary and secondary distribution, transformers and capacitors in distribution networks, smart power grids

Reading List
See separate document.

Examination
Assessment is based on a written exam, mandatory laboratory sessions, and laboratory reports.

If students have a decision from Karlstad University entitling them to Targeted Study Support due to a documented disability, the examiner has the right to give such students an adapted examination or to examine them in a different manner.

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