

Electrical Distribution Systems, 7.5 credits

Elanläggningar, 7.5 hp

Second level

Main field: Energy Engineering AIN

Syllabus is adopted by the Research and Education Board (2015-02-24) and is valid for students admitted for the spring semester 2015.

Placement in the Academic System

The course is part of Master's Programme in Renewable Energy Systems

Prerequisites and Conditions of Admission

Bachelor's degree in Energy Engineering or equivalent.

Course Objectives

This course will provide in-depth knowledge and experience of how the electrical distribution systems are dimensioned and how their loads are at both normal and abnormal operating conditions. The course will also provide training and skills in the application of research results and training in critical evaluation of research results, especially in transfer into practical application.

Following successful completion of the course the student should:

Knowledge and understanding

- Obtain current and new information about how electric network are designed and how calculations are carried out and understand the mathematical background.
- Understand the importance of power distribution in a wider energy and technical context.

Skills and Ability

- Implement, analyse and propose systems changes and make recommendations depending on network calculations.
- Document and present findings and results.

Judgement and approach

- Evaluate the technical development and research in a larger scientific context.
- Critically evaluate own and others' results and relevance for the area of interest.

Primary Contents

Calculation and dimensioning of electrical distributions-systems is a key course for engineers with an interest in the distribution and production of electrical energy. The course will be presented on the mathematical foundations of modern computer-based calculations tools. These calculation program can be used to investigate the electrical networks sensitivity to various disturbances and how robust they are. Parts of the course will be used to practical exercises in a project. Various methods for solving stationary and time-dependent problems will explained. Current research will be presented.

Teaching Formats

The course includes lectures, exercises and laboratory tests as well as field trips. The course includes a project. The project addresses the design of an electrical power system with computer programs. An example is the electrical system for a wind farm. The project must be orally presented and reported in writing in a report.

Examination

The overall grades of Fail, 3, 4 or 5 will be awarded for the course.

The examination consist of assignments, projects and written examination.

Course Evaluation

Course evaluation is part of the course. This evaluation should offer guidance in the future development and planning of the course. Course evaluations should be documented and made available to the students.

Course Literature

(Revised 2015-02-19)

Saadat, H. *Power System Analysis*. PSA Publishing, 2010

Additional exercise papers