FEI3340 Fault Analysis and Protection Principles in Electric Power Systems 10.0 credits

Analys av fel och skyddsprinciper i elkraftssystem

This is a translation of the Swedish, legally binding, course syllabus.

Establishment

Course syllabus for FEI3340 valid from Autumn 2019

Grading scale

P, F

Education cycle

Third cycle

Specific prerequisites

Completed master-level education or equivalent. Students are typically expected to be doctoral students in subjects within the Electric Power area.

Language of instruction

The language of instruction is specified in the course offering information in the course catalogue.

Intended learning outcomes

After taking this course the student should be able to demonstrate the ability to:

- Describe analytically, and implement numerically, methods for circuit solution of faulted power systems.
- Implement in software a protection algorithm for sampled data.
- Contrast good and bad points of different protection principles for various applications.
- Define and discuss ways in which changes in power systems, in particular the move towards a sustainable energy supply, affect the demands on protection systems now and in the future.
- Search, select, and critically evaluate suitable sources for obtaining new, detailed knowledge about a research topic within the course's scope.
- Present their new knowledge accessibly in oral and written form.

Course contents

Fault types. Analysis of balanced faults. Direct and symmetric-component analysis of unbalanced faults, and their relation and limitations. Core principles used for protection, including some signal-processing aspects. Future challenges, including consequences of increased renewable generation.

Disposition

The first part has a common set of subjects for all students, based on lessons and assignments. The second part has specialisation based on self-study and seminars.

The exact distribution of time may vary according to the Course-PM of each round: indicatively, lessons (16h), seminars (10h), study and assignments in common parts of the course (80h), project work in the specialization (120h), and the remainder of time on revision for a written examination.

Course literature

Course material will be specified further for each round of the course. It is based on several books and many further resources of published articles and manuals and the course's own notes and assignments.

Equipment

Nothing beyond availability of a computer.

Examination

- EXA1 - Examination, 10.0 credits, grading scale: P, F

Based on recommendation from KTH's coordinator for disabilities, the examiner will decide how to adapt an examination for students with documented disability.

The examiner may apply another examination format when re-examining individual students.

If the course is discontinued, students may request to be examined during the following two academic years.

The common part of the course is examined based on several assignments and on a final written examination. The specialization is examined based on the final report and on the presentation and discussion at seminars. The subject of the specialization is defined by the student, and must be approved by the examiner before getting started.

Other requirements for final grade

All the four parts of examination must be approved in order to pass the course: assignments, written examination, presentations and final report.

Ethical approach

- All members of a group are responsible for the group's work.
- In any assessment, every student shall honestly disclose any help received and sources used.
- In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.