EG2070 FACTS and HVDC in Electric Power Systems 7.5 credits

FACTS and HVDC in Electric Power Systems

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

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

Establishment

Course syllabus for EG2070 valid from Autumn 2010

Grading scale

A, B, C, D, E, FX, F

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

EG2030 Power systems, advanced course (at least grade E), EJ2300 Power electronics (at least grade E), EG2020 Power systems, basic course (at least grade E), also documented proficiency in English B or equivalent.

Language of instruction

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

Intended learning outcomes

After completion of the course you will be able to

- describe how FACTS and HVDC are designed
- explain and analyze their functions
- derive basic mathematical models for these components
- analyze the impact of theses components on power system stability
- perform calculations on different control strategies for these devices

Course contents

FACTS (Flexible AC Transmission System) and HVDC (High Voltage Direct Current) are controllable devices whose functions are to enhance the security, capacity and flexibility of power transmission systems. Application of these components in power systems implies an improvement of

- transient stability
- voltage stability
- damping of power oscillations
- optimal power flow

The course is given in English, and starts with a review of static and dynamic issues in power systems. As a technical solution to theses issues, FACTS and HVDC will be presented. It will be shown that FACTS and HVDC may be a technical solution to these issues. It will be discussed in the course how these components are designed and also what functions they have. Then, basic mathematical models and control strategies will be presented for these components to analyze the impact of theses components on power system stability.

Course literature

Course compendia

Examination

- LAB1 - Laboratory Work, 1.5 credits, grading scale: P, F
- TEN1 - Examination, 6.0 credits, grading scale: A, B, C, D, E, FX, 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.

Other requirements for final grade

One examination, 6 (HEC).
Two laboratory exercises (incl. compulsory preparatory work), 1.5 (HEC).

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.