EG2030 Power Systems, Advanced Course 7.5 credits

Elsystem, fortsättningskurs

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

Establishment

Course syllabus for EG2030 valid from Autumn 2007

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

General admission requirements

Language of instruction

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

Intended learning outcomes

This course provides a deeper knowledge of the analysing methods in EG2020 Power System, basic course. The course deals with advanced methods for analysis of power systems as well as methods concerning damping, stability and frequency control in integrated power systems.

The course consists of two parts, namely:

- Static part which is dealing with optimal load flow, sensitivity analysis and fault analysis.
- Dynamic part which is dealing with power system stability and control.

Upon completion of the course the

student will be able to

- Perform an optimal power flow for reactive power dispatching to decrease power losses.
- Analyze the system performance where there is an unbalanced fault, and also calculate the corresponding fault current.
- Create mathematical models for dynamic and stability analysis of multi-machine power systems.
- Describe and analyze electromechanical modes in power systems.
- Design excitation systems to improve transient stability, and power oscillations damping.
- Explain and perform frequency control.
- Apply the theory to real-life problems.

Course contents

The course treats models and computation methods for power system stability and control. In the course assignments these models and methods are applied to solve realistic problems with computer programs written in MATLAB.

The following areas are treated in the course:

Optimal load flow and sensitivity analysis: reactive power dispatching to decrease power losses.

Fault analysis: system models, and calculation of fault currents where there is an unbalanced fault.

Stability: transient and small-signal stability, and simulation models.

Control: power oscillation damping and frequency control.

Course literature

Course compendia

Examination

- TEN1 - Examination, 7.5 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.

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

Other requirements for final grade

One examination, 7.5 cr.

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.