EG2220 Power Generation, Environment and Markets 7.5 credits

Elproduktion, miljö och marknader

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

Establishment

Course syllabus for EG2220 valid from Spring 2019

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Specific prerequisites

- EG2200/EG2205 Operation and Planning of Electricity Generation (or equivalent)
- English B/English 6 (or equivalent)

Language of instruction

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

Intended learning outcomes

The aim of the course is that the students learn how renewable power generation affects operation and planning of electric power systems, and how the design of the electricity market can be adjusted then the amount of varying, renewable generation (for example wind power or solar energy) is increasing. The course is also considering additional markets that support renewable generation, for example markets for green certificates and emission trading. The course comprises theory, computation methods (in particular optimisation theory) as well as examples from reality.

To pass the course, the students should show that they are able to

• describe the principles of how an electricity market and other related markets can be organised, and analyse how the design of these markets affect renewable generation,

• perform rough estimations of electricity prices as well as analyse factors that have a large importance for the electricity pricing, and to indicate how these factors affect for example producers and consumers,

• formulate planning problems of hydro-thermal power systems in electricity markets with large volumes of varying renewable generation,

• analyse how the grid regulation affects the development of renewable generation,

• describe and explain the challenges in a power system with very large volumes of varying renewable generation,

• give a short oral presentation of the solution to a problem within power generation, environment and markets.

Course contents

The course covers the following main topics: the relation between the environmental impact of the power system and the design of the electricity market, stochastic planning models for power generation, grid regulation and expansion planning, and future power systems. Theory and examples are presented in lectures. The students are then applying the theory to a number of assignments. The course includes smaller assignments, which are mandatory and presented orally, as well as larger assignments, which are voluntary and presented in written reports.

Disposition

Lessons, seminars, project assignments.

Course literature

L. Söder & M. Amelin, "Efficient Operation and Planning of Power Systems"

Examination

- PRO1 - Project Work 1, 4.0 credits, grading scale: A, B, C, D, E, FX, F
- TEN1 - Examination, 3.5 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 final grade is equal to the grade of the project assignments.

Other requirements for final grade

Each part of the examination must be passed.

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.