EG2230 Electricity Pricing and Emissions 6.0 credits

Elpriser och utsläpp

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

The official course syllabus is valid from the autumn semester 2022 in accordance with head of school decision: J-2022-0449.Decision date: 14/03/2021

Grading scale

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

Education cycle

Second cycle

Main field of study

Electrical Engineering

Language of instruction

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

Intended learning outcomes

After passing the course, the student shall be able to

- explain how the balance between generation and consumption is maintained in an electric power system, calculate how the frequency is affected by various events in the power system and design the frequency control so that there are sufficient margins in the power system,

- describe the principles of how electricity markets can be designed including regulatory framework to limit carbon dioxide emissions from electricity generation and to promote carbon dioxide free electricity generation,

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

- apply Monte Carlo simulation to simulate an electricity market and use the simulation results to analyse the consequences of different measures

- give a short oral presentation of the solution to a problem in electricity pricing and emissions,

in order to learn theory and calculation methods to analyse electricity pricing and emissions from electricity generation.

Course contents

The course includes four main fields of study: frequency control, introduction to electricity markets, calculations of prices and carbon dioxide emissions and Monte Carlo simulation of electricity markets. Theory and examples are presented in lectures. The students may then apply the theory on simplified (but realistic) examples.

Specific prerequisites

Knowledge in numerical methods, 6 higher education credits, equivalent to completed course SF1519/SF1545/SF1546/SF1547.

Knowledge in probability theory, 6 higher education credits, equivalent to completed course SF1917/SF1918/SF1920.

Examination

- PRO1 - Project assignment, - credits, grading scale: A, B, C, D, E, FX, F
- PRO2 - Project assignment, - credits, grading scale: A, B, C, D, E, FX, F
- SEM1 - Seminars, 3.0 credits, grading scale: P, F
- TEN1 - Written exam, 3.0 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.

PRO1 and PRO2 are optional modules.

Pass grade on the modules SEM1 and TEN1 are required for the final grade E. Students who have passed SEM1 and TEN1 and pass one of the two optional project assignments will receive the highest grade from PRO1 and PRO2 as final grade.

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.