



MJ2405 Sustainable Power Generation 9.0 credits

Uthållig kraftproduktion

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

Establishment

Course syllabus for MJ2405 valid from Autumn 2010

Grading scale

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

Education cycle

Second cycle

Main field of study

Mechanical Engineering

Specific prerequisites

B.Sc. in Engineering with prerequisite in MJ1112 Thermodynamics 9 ECTS, MJ1401 Heat Transfer 6 ECTS and SG1220 Fluid Mechanics 6 ECTS or a combination of these subjects of at least 15 ECTS.

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 the course the student should be able to

- Understand the principles of different power generation methods, both conventional and renewable
- Analyze the conventional power methods thermodynamically
- Make a simple economical assessment of a power plant
- Perform an environmental assessment and suggest measures for emission control in a power plant
- Compare different power generation alternatives and choose the most suitable for given conditions
- Understand physics of nuclear power and how such a system can be built up
- Describe some of the components in a power plant

Course contents

The first course part about heat and power technology brings up techniques for large- and small scale electricity and heat generation in power plants fired on biomass, oil, natural gas or coal. Thermodynamic power cycles and analysis, combustion, boilers, emissions, life-cycle-cost and availability are all included in this course part. The second part of the course brings up nuclear reactor technology and nuclear power safety and focuses on BWR and PWR technologies. Here material aspects, fuel cycles and plant control are included. Environment and security issues are brought up.

Course literature

CompeduHPT; www.compedu.net

Examination

- ÖVN1 - Exercise, 1.5 credits, grading scale: P, F
- ÖVN2 - Exercise, 1.5 credits, grading scale: P, F
- TEN1 - Written exam, 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.

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

Other requirements for final grade

Written exam (TEN1; 6 cr),
exercises (ÖVN1; 1,5 cr), (ÖVN2; 1,5 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.