



MJ2405 Sustainable Power Generation 9.0 credits

Uthållig kraftproduktion

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

On 15/10/2021, the Dean of the ITM School has decided to establish this official course syllabus to apply from autumn term 2022 (registration number M-2021-1922).

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:

1. Describe and discuss the principles and the challenges behind energy conversion processes in industrial setting, including thermal and electrical energy processes together with their environmental footprint, from the point of view of supply-side management in both conventional and renewable power generation cycles and systems.
2. Characterize the parameters, evaluate the schematic layout, calculate the performance and assess the sustainability aspects of the established thermal power cycles and components, as well as reassessing the role of thermal power plants for large-scale electricity generation.
3. Estimate the feasibility from a system perspective and motivate plausible efficiency improvements for the application of innovative technologies and alternative energy solutions in modern integrated power generation and distribution systems.
4. Determine the importance of electrical engineering aspects and justify technological modifications from an energy market management perspective for the continuous evolution towards sustainable energy production and distribution systems.

Course contents

The course "Sustainable Power Generation" is based on a comprehensive analysis of both established and innovative technologies for the production and distribution of electric power and heat using both conventional and renewable fuels and methods; with a focus on thermal power plants in various designs and energy system aspects in practice, regardless of the primary energy source. This course co-shares sustainability principles and relevance to renewable energy technologies and the future energy-smart society with several other courses running concurrently and logically related to each other by sharing content and delivering a common view on various aspects of energy-related sustainability.

Examination

- TEN1 - Written exam, 6.0 credits, grading scale: A, B, C, D, E, FX, F
- ÖVN1 - Exercise, 1.5 credits, grading scale: P, F
- ÖVN2 - Exercise, 1.5 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.

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.