

Course Syllabus

Combined Heat and Power Systems 7.5 Credits, First Cycle

Learning Outcomes

On completion of the course, students will be able to:

- perform combustion calculations, analyse flue gas emissions and establish energy balances and efficiency calculations for selected combined heat and power systems,
- describe and compare technologies for the storage and combustion of common biofuels, as well as evaluate the combustion properties and environmental impact of fuels based on their characteristic parameters,
- describe the design and technical solutions for different types of boilers and combined heat and power systems, including district heating systems, as well as identify how waste heat sources can be utilised and how efficiency improvements can be implemented.

Course Content

The course covers combined heat and power (CHP) systems and district heating systems and their role in the energy system. The course provides an overview of steam boilers (including nuclear power), the Rankine cycle for electricity generation as well as district heating systems, including district heating substations. It discusses their efficiency and the potential utilisation of biofuels, waste heat and solar energy.

The course offers an overview of available biofuels, fuel properties, and fuel storage. It also addresses combustion reactions, combustion calculations and emissions from combustion and also provides an overview of technologies for emission reduction.

Assessment

- Lab
- Project
- Invigilated written examination either on campus or online, depending on the examination session

Grades

The grading scale used for the final course grade is U, 3, 4, 5.

Grades are reported as follows:

- Lab - 0.5 Credits | U–G
- Project - 2.0 Credits | U–G
- Invigilated written examination either on campus or online, depending on the examination session - 5.0 Credits | U, 3, 4, 5

Entry Requirements

Thermodynamics, 7,5 credits

Other Information

Overlaps EG1013.

This course cannot be counted towards the same degree along with courses that have equivalent content.

If the student has received a decision/recommendation granting study support from Dalarna University because of a disability, then the examiner has the right to offer an alternative examination arrangement. The examiner takes into account the objectives in the course syllabus when deciding whether the examination can be adapted in accordance with the decision/recommendation.

Subject:

Energy Technology

This course can be included in the following main field(s) of study:

1. No main field of study

Progression Indicator:

1. GXX

Approved:

Approved 17 December 2024

Valid from 10 February 2025