UNIVERSITY OF BORÅS

Energy Recovery Processes

Energiomvandling ur avfall - viktiga processteg

5 credits

Ladok Code: 42RE05
Version: 5.0
Established by: Committee for Education in Technology 2019-03-08
Valid from: Spring 2019

Education Cycle: Second cycle
Main Field of Study (Progressive Specialisation): Resource Recovery (A1N)
Disciplinary Domain: Technology
Prerequisites: Degree of Bachelor of Science or Bachelor of Science in Engineering with major in Mechanical Engineering, Industrial Business Economics, Energy Technology, Chemical Engineering, Biotechnology, Civil Engineering, Textile Engineering or Structural Engineering
or
Bachelor's degree in physics or chemistry.
Knowledge of thermodynamics
Proficiency in English equivalent to :
IELTS (academic training), 6.5 (with no part of the test below 5.5)
or
TOEFL (Internet based): 90 (with a minimum of 20 on the written part)
or
TOEFL (paper based): 575 (with a minimum of 4.5 on the written part)
For further information about English language proficiency requirements, please view: www.hb.se/Englishlanguageproficiency
Subject Area: Energy Technology
Grading Scale: Seven-degree grading scale (A-F)

Content

This course is intended to prepare students for future courses in the Masters programme. A basic knowledge of electricity and heat production in a steam power plant and combustion has a central place in this course. In addition, other applications for material and energy balances are taken up such as the production of biogas and bioethanol.
• Material and energy balances
• Combustion
• The steam power process

Learning Outcomes

After completing the course, students must be able to:
1 Knowledge and understanding
1.1 Give an account of the basic concepts involved in combustion such as excess air and flue gas losses and be able to give an account of different combustion-technology measures for reducing emissions,
1.2 Give an account of the construction of a boiler,
1.3 Give an account of the steam power cycle and explain why, and give an account of how, the construction of the system affects its efficiency,
2. Skills and abilities
2.1 Perform simple material and energy balance calculations with applications relating to resource recovery,
2.2 Calculate the different efficiencies for different types of steam power plants, and set up and calculate energy and material balances,
2.3 Perform combustion calculations.

Forms of Teaching

Teaching consists of lectures, exercises, study visits and project work.
Teaching will be conducted in English.

The language of instruction is English.

Forms of Examination

The final grade of the course is issued only when all parts are approved.

Student rights and obligations at examination are in accordance with guidelines and rules for the University of Borås.

Literature and Other Teaching Materials

Material distributed by lecturer, plus material that can be accessed via the University's computers.

Student Influence and Evaluation

The Head of Academy and course coordinator are responsible for ensuring that students are invited systematically and regularly to put forward their views on the course. The results of the evaluations will be reported back to the students and will form the basis for the future structure of the course.

Miscellaneous

The overall objective of the course is to provide the student with a firm foundation for future courses in the Masters programme. The student is to gain an insight into the production of heat and electricity in steam power plants and in combustion plants. In addition, the student is to gain knowledge that makes it possible to apply material and energy balances to relatively simple biological processes.