



Biofuels & Biological Treatments of Wastes

Biobränsle och biologisk behandling av avfall

5 credits

5 högskolepoäng

Ladok Code: 42K21B

Version: 1.0

Established by: Education Committee 2014-10-06

Valid from: Autumn 2014

Education Cycle: Second cycle

Main Field of Study (Progressive Specialisation): Resource Recovery (A1F)

Disciplinary Domain: Technology

Prerequisites: Meets the requirements for admission to the degree of Bachelor of Science in Engineering (or equivalent).

Subject Area: Energy Technology

Grading Scale: ECTS-credits

Content

- Overview of world market for biofuels
- Bioethanol production
 - Different types of fermenter and their operation
 - Different types of processes depending on the raw materials
 - Environmental impact
- Biogas production
 - Microbiological decomposition into biogas
 - Design of anaerobic digestors for biogas production
 - The use of biogas as a vehicle fuel and for heating, as well as further processing to generate electricity
- Biodiesel from vegetable oil and from used cooking oil
- Integration of biological processes in traditionally non-biological industries

Learning Outcomes

After completing the course, students must be able:

1 Knowledge and understanding

1.1 Describe different processes for the production of bioethanol, biogas and biodiesel and other biofuels,

2. Skills and abilities

2.1 Calculate the dwell time and fermenter size required to produce a certain quantity of biogas or bioethanol,

2.2 Perform simple lab experiments in order to estimate a material's suitability for use as a substrate in a biogas plant or

bioethanol fermenter,

3. Judgement and approach

3.1 Based on various types of raw materials, be able to compare the suitability of different biological processes and assess which process has the highest energy efficiency,

3.2 Discuss and take into account the various ethical aspects of ethanol production,

3.3 Evaluate results from simple lab experiments.

Forms of Teaching

Teaching will consist of lectures, laboratory work and project work.

The language of instruction is English.

Forms of Examination

The course will be examined through the following examination elements:

Examination

Learning outcomes:

Credits: 3.5

Grading scale: Seven-degree grading scale (A-F)

Written Assignment

Learning outcomes:

Credits: 0.5

Grading scale: Seven-degree grading scale (A-F)

Lab Work

Learning outcomes:

Credits: 1

Grading scale: Fail (U) or Pass (G)

A weighted average of the scores for the examination elements Exam and Submission task determines the course's final grade which is posted only after all elements have been 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 handed out in the form of research publications, reports, etc.

Student Influence and Evaluation

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

Miscellaneous