



Biofuels & Biological Treatments of Wastes

Biobränsle och biologisk behandling av avfall

7.5 credits

7.5 högskolepoäng

Ladok Code: TK8123**Version:** 3.0**Established by:****Valid from:** Autumn 2011**Education Cycle:** Second cycle**Main Field of Study (Progressive Specialisation):** Energy Technology (A1F)**Disciplinary Domain:** Technology**Prerequisites:** These prerequisites do not apply to students within the programme Science without Borders.

Accepted for masters course Energy recovery and recycling of materials Sustainable technical systems or equivalent knowledge.

Subject Area: Energy Technology**Grading Scale:** ECTS-credits

Content

- Bioethanol production
 - microbiology and physiology
 - enzymatic hydrolysis of starch and cellulose
 - different types of fermentor and their operation
 - different types of process depending on raw materials such as molasses, grain, lignocellulose
 - Summary of the world market for biofuels
 - environmental impact
 - Biogas
 - microbiological breakdown to biogas - design of digestion chamber for biogas production
 - use of biogas as a vehicle fuel and for heating, as well as further refinement into electricity.
 - Biodiesel from vegetable oil and from used cooking oil.
 - Biological leaching of minerals
 - Integration of biological processes in traditionally non-biological industries.
 - Biorefinery

Emphasis is the course is on the sections concerning biogas and bioethanol. The other parts will be dealt with on a more superficial level.

Learning Outcomes

After completing this course, students must be able:

- To describe enzyme kinetics and the growth of microorganisms with application to the production of bioethanol and biogas.
- To calculate the dwell time and fermentor size required to produce a certain quantity of biogas or bioethanol

To work on the basis of various types of material and raw material to be able to compare the suitability of various processes, and assess which process has the greatest energy exchange.

Forms of Teaching

Teaching will consist of lectures and laboratory work.

The language of instruction is English.

Forms of Examination

Examination of the course occurs through:

- Examination 7.5 Grading scale: EC

The course objectives will be examined by means of a written examination or by means of a verbal examination, if the examiner deems this to be appropriate. The examination will determine the final grades for the course. ECTS grading scale.

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

Literature and Other Teaching Methods

Literature

Material handed out in the form of research publications, reports, etc.

Student Influence and Evaluation

The head of department and teacher responsible for the course 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 form the basis for the structure of the course.

Miscellaneous