



Course syllabus

Faculty of Technology

Department of Built Environment and Energy Technology

2BT008 Konverteringsprocesser inom biobränsleproduktion, 7,5 högskolepoäng

Conversion processes in biofuel production, 7.5 credits

Main field of study

Energy Technology

Subject Group

Energy Technology

Level of classification

First Level

Progression

G2F

Date of Ratification

Approved 2014-06-03

Revised 2022-02-07 by Faculty of Technology. Assessment methods are revised and adaptation of the syllabus according to local governing documents.

The course syllabus is valid from autumn semester 2022

Prerequisites

At least 60 credits in the Bachelor program "Energy and Environment" with a minimum passing grade on the courses 1BT010 "Biofuel Knowledge", 1KT002 "Chemistry for Engineers", 1KT003 "Biotechnology for Engineers", 1BT014 "Chemical Engineering Processes" and 2BT005 "Community Energy Systems" or the equivalent.

Objectives

After completing the course the student is expected to

- possess a deep knowledge about technologies to use biomass as a feedstock for energy or for the production of new substances, eg in biorefinery processes or in energy-combines,
- be fluent, in speech and in writing, with energy terminology,
- be fluent, in reading and in writing, with chemical terminology and formulae,
- understand the properties with different feedstocks and their expected reactions,
- possess a deep knowledge about the unit operations and upgrading processes for biomass and their heat- and mass balances,
- be able to critically analyse, judge and compare different routes or the production and delivery of a specific energy carrier or energy service,
- be able to critically analyse, judge and compare the over-all environmental impact from different routes or the production and delivery of a specific energy carrier or energy service and to put this in a regional, local and/or global perspective,
- be able to critically analyse, judge and compare different routes or the production and delivery of a specific energy carrier or energy service from a societal

- economy and social perspective,
- be able to judge the feasibility of different biomass feedstocks for different applications,
- be oriented about relevant software and be able to perform simple process simulations.

Content

The course consists of the following concerning biomass:

- History
- Supply and demand
- Biogas
- Bioethanol
- Biodiesel
- Gasification and pyrolysis
- Upgrading of producer gas
- Synthetic transportation fuels
- Biorefineries
- Process simulation
- Individual specialisation including poster presentation

Type of Instruction

Lectures, guest lectures, laboratory work, study visits and individual tuition.

Examination

The course is assessed with the grades U, 3, 4 or 5.

Assessment of student performance is made through examination and poster presentation. Assessment is both written and oral. The final grade is determined by the examination.

Repeat examination is offered in accordance with Local regulations for courses and examination at the first and second-cycle level at Linnaeus University.

If the university has decided that a student is entitled to special pedagogical support due to a disability, the examiner has the right to give a customised exam or to have the student conduct the exam in an alternative way.

Course Evaluation

During the implementation of the course or in close conjunction with the course, a course evaluation is to be carried out. Results and analysis of the course evaluation are to be promptly presented as feedback to the students who have completed the course. Students who participate during the next course instance receive feedback at the start of the course. The course evaluation is to be carried out anonymously.

Credit Overlap

The course cannot be included in a degree along with the following courses of which the content fully, or partly, corresponds to the content of this course: 1BT003, 7.5 credits

Other

Some course elements may entail costs defrayed by the course participant. On request, a Swedish University course certificate will be awarded upon successful completion of the course.

Required Reading and Additional Study Material

Robert C. Brown *Biorenewable Resources Engineering New Products from Agriculture*, Wiley Blackwell 203. 250 pages

Ralph E H Sims *The Brilliance of Bioenergy In Business and Practice*, James & James Ltd 2007 ISBN: 078113808842 328 pages

2002, ISBN: 07013078872, 328 pages

Gerard Tortora, Berdell Funke, Christine, Microbiology, an introduction, latest edition, Pearson, 400 pages, or equivalent

Material supplied by the department.