Linnæus University

Jnr: 2014/1460-3.1.2

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 by Faculty of Technology 2014-06-03
The course syllabus is valid from spring semester 2015

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. Information on compulsory elements is given at the course start.

Examination

The course is assessed with the grades U,3,4 or 5.
Final grade is assessed by weighing the exam score and poster presentation.

Assessment of student performance is made through examination and poster presentation. Assessment is both written and oral.

In order to pass, the objectives of the course should be achieved.

Course Evaluation

A course evaluation will be carried out and compiled after the course is completed. The compilation will be presented to the current board as well as to the students and filed.

Credit Overlap

This course cannot be part of a degree in combination with another course in which the content fully or partly correspond to the content of this course: The course may not be included in a degree together with other course whose contents completely or partly corresponds with the contents of this course.

Overlaps entirely course 1BT003.

Other

Some course elements may entail costs defrayed by the course participant. The course is offered in English, if there are international participants. 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, 2002

Tortura/Funke/Case, Microbiology, an introduction, the latest edition, Pearson, 400

pages, or equivalent

Material supplied by the department.