



Course syllabus

Faculty of Technology

Department of Built Environment and Energy Technology

4BT320 Bioenergi och avfall som en resurs, 7,5 högskolepoäng

4BT320 Bioenergy and waste as a Resource, 7.5 credits

Main field of study

Bioenergy Technology

Subject Group

Energy Technology

Level of classification

Second Level

Progression

A1N

Date of Ratification

Approved by Faculty of Technology 2023-08-17

The course syllabus is valid from spring semester 2024

Prerequisites

General entry requirements for second cycle studies and specific entry requirements:

- Bachelor of Science in Chemical Engineering, Energy Technology, Environmental Technology, Civil Engineering, Material Science or equivalent
- English 6 or equivalent

Objectives

After this course, the students should:

- critically explain the situation of waste generation locally, regionally and globally
- identify and evaluate potentials of using waste as a resource for different purposes with respect to relevant scientific and society aspects
- describe and explain about several processes and technologies those are used for converting/transferring waste to energy and deepen knowledge in the area
- have capability of explaining and evaluating climate change effects of using waste to replace fossil fuels

Content

The course contains of the following elements:

- overview of waste generation and recycling in Sweden, Europe, World

- forest biomass residue and industrial wood waste
- municipal waste classifications and properties
- current waste treatment practices
- technologies and processes to convert biomass and municipal waste to convenience final energy types and energy services

- direct combustion
- gasification and synthesis of biofuels
- composting
- anaerobic digestion

- environmental effects and sustainability of handling and using waste
- climate change effects of using biomass and waste to replace fossil fuels.
- Impacts of waste as a resource to integrated energy system and sustainable built environment.

Type of Instruction

This course is given by lectures, seminars and site visits.

Examination

The course is assessed with the grades A, B, C, D, E, Fx or F.

The grade A constitutes the highest grade on the scale and the remaining grades follow in descending order where the grade E is the lowest grade on the scale that will result in a pass. The grade F means that the student's performance is assessed as fail (i.e. received the grade F).

The course is examined as both written report (5.5 credits) and oral presentation (2 credits). Assessment of the student's performance usually takes place during the whole course learning period through project development and seminars. The final grade is a weighted average of assessment methods.

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 course/courses of which the content fully, or partly, corresponds to the content of this course: 4BT313, 7.5 credits

Other

Certain course elements may entail costs that have to be defrayed by the students.

Grade criteria for the A–F scale are communicated to the student through a special

document. The student is to be informed about the grade criteria for the course by the start of the course at the latest.

Required Reading and Additional Study Material

Required literature

The course reading material will comprise carefully curated reports and scientific publications that are directly relevant to the course's objectives and content. Comprehensive information about the literature is provided at the beginning of the course.

The literature is about 200-300 pages.