Course: BioMass Energy — credits: 5

Course code	RWVM23BME
Name	BioMass Energy
Study year	2026-2027
ECTS credits	5
Language	English
Coordinator	F. Faber
Modes of delivery	Education
Assessments	Assignment BioMass Energy - Assignment BioMass Energy Theory - Written, organised by STAD examinations

Learning outcomes

Objective of the module / skills:

At the completion of this topic the students should know:

- Energy contents and chemical reactions in carbon based chemistry
- Basic concepts of microbial metabolism related to biofuel production

At the completion of this topic the students should be able to:

- Select appropriate methodologies for biomass energy conversion technologies
- Design biomass conversion processes, with the emphasis on biological conversion processes, using bioreactors.
- Calculate/model energy yield from different types of biomass.
- Accurately perform experiments in a bio lab and measure, interpret and analyse data.
- Write a scientific lab report based upon the combined experimental data, drawing appropriate conclusions linked to scientific literature.

Content

Content:

With fossil fuel resources becoming limiting, a possible alternative for molecule-based energy carriers is the use of biomass (e.g., organic waste products)/ The module ‘Biomass Energy’ describes the various processes and techniques involved in conversion of the energy stored in organic material into various forms of usable bioenergy. Present conversion techniques already show the ability to connect biofuels to the current infrastructure. However, the availability of biomass as well as the current conversion efficiencies of the various conversion techniques are not sufficient to replace fossil fuels.

Basic knowledge on chemical and biological conversion processes of biomass will lead to an integral approach, increasing the potentials for biomass in the fields of energy for the generation of renewable energy. The biomass conversion techniques described in the module ‘Biomass Energy’ might play just as an important role in the transition from fossil fuels to alternative energy sources as other fields of energy such as wind and solar energy. During the course various mathematical exercises will be done. This module contributes to the overall knowledge on renewable energy sources students acquire during the core of the MSc program.

The module ‘Biomass Energy’ covers energy conversion processes related to biomass. In the module students will gain basic knowledge of various biomass conversion processes (Theoretical part) and will apply this knowledge in a lab experiment producing biogas in a bioreactor (Laboratory part).

Included in programme(s)

European Master in Renewable Energy

School(s)

Engineering, Life Sciences & ICT

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