Hanze University of Applied Sciences Groningen

Course: BioMass Energy — credits: 5

Course code	ZWVH18BME
Name	BioMass Energy
Study year	2021-2022
ECTS credits	5
Language	English
Coordinator	C.B. Vogt
Modes of delivery	Practical / Training Tutorial
Assessments	Assignment BioMass Energy - Assignment BioMass Energy Theory - Computer, organised by STAD examinations

Learning outcomes

At the completion of this topic the students should know
The fundamentals of residual biomass and energy crops
The fundamentals of biomass conversion processes and devices,with the emphasis on biological conversion processes, using bioreactors.

At the completion of this topic the students should be able to
Select appropriate methodologies from the range of different biomass energy technologies
Processing of analytical results obtained during the a practical course on biogas production into a scientific report, drawing appropiate conclusions linked to scientific literature.

Content

Content:
With fossil fuel resources becoming limited, a possible alternative energy resource is the use of
biomass. The module ‘Biomass Energy’ describes the various processes and techniques
involved in conversion of the energy stored in biomass to other types of usable bio-energy.
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. There is a special emphasis on the process of anaerobic digestion, producing biogas from various types o biomass. During the course various mathematical exercises will be done related to the yield of bioenergy by the various conversion techniques. This module contributes to the overall knowledge on renewable energy sources students acquire during the core of the MSc program.

The module ‘Biomass Energy’ also includes a practical course, in which the theoretical knowledge on anaerobic digestion will be applied in a lab experiment producing biogas in a bioreactor. General lab techniques will be combined with complex analytical measurements, resulting in various parameters on biogas production, which will be the basis an a scientific report written by the students.

Included in programme(s)

European Master in Renewable Energy

School(s)

Institute of Engineering