UCLouvain

lmeca2325

2023

Biomass conversion

5.00 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Gerin Patrick ;Jeanmart Hervé ;
Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Main themes	• Origin and composition of the biomass • Physico-chemical characterisation of biomass • Thermo-chemical conversion (pyrolysis, combustion, gasification) • Bio-chemical conversion (fermentation)
Learning outcomes	**At the end of this learning unit, the student is able to :** In consideration of the reference table AA of the program "Masters degree in Mechanical Engineering", this course contributes to the development, to the acquisition and to the evaluation of the following experiences of learning: • AA1.1, AA1.2, AA1.3 • AA2.3, AA2.4, AA2.5 • AA3.1, AA3.3 • AA5.1, AA5.2, AA5.3 1 • AA6.1, AA6.3 At the end of the course, the student should • be able to characterize a biomass feedstock and evaluate the potential of a biomass source; • be able to describe, illustrate and compare the different biomass conversion routes; • be able, given a biomass source and an application, to select technically the best conversion route. • be able to design a facility based on detailed specifications • be able to start a PhD in the field of biomass energy.
Evaluation methods	The evaluation is based on a weighted average of the different activities: - an oral examination with or without written preparation with the different course teachers. - projects and assignments carried out during the year. As projects cannot be organised outside the course period (first semester), the mark acquired during the semester will be final for all sessions (Article 78 of the RGEE). The weighting is announced to the students during the semester.
Teaching methods	The course is based on classroom teaching by the two professors and on applications of the material in the form of assignments, exercises, laboratories or projects. The content of the course is reviewed every year to take into account the evolution of science in the areas covered, both at UCLouvain and in the scientific community. Industrial visits related to the course and laboratories are also possible in order to illustrate the concepts discussed in the course.
Content	This is an advanced optional course. It is focused on the study of the different biomass conversion routes for energy purposes, in the context of energy transition. It is split into two parts. One is dealing with the thermo-chemical conversions: pyrolysis, combustion and gasification. The other one is devoted to the bio-chemical conversion routes: ethanologenic fermentation and methanogenic fermentation. The production of biodiesel from oily biomass is not addressed.
Inline resources	http://moodleucl.uclouvain.be/enrol/index.php?id=7878
Other infos	This course is open to student following a master in engineering or bio-engineering.
Faculty or entity in charge	MECA

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Mechanical Engineering	MECA2M	5		
Master [120] in Chemistry and Bioindustries	BIRC2M	5		
Master [120] in Electro-mechanical Engineering	ELME2M	5		
Master [120] in Energy Engineering	NRGY2M	5		