


3.00 credits

30.0 h

Q1

Teacher(s)	De Jaeger Emmanuel ;Gerin Patrick ;Jeanmart Hervé ;
Language :	English
Place of the course	Louvain-la-Neuve
Prerequisites	Background in physics and (bio)chemistry Dedicated introductory modules are available for ENVI students (self learning) Dedicated modules are available for EPL/AGRO students (self learning)
Main themes	The course aims at providing the students with a broad, diversified and multidisciplinary background on renewable energy. It gives a global view of the various renewable energy sources and uses, with emphasis on the available resources, conversion technologies, environmental impacts, and socio-economical aspects of their development.
Learning outcomes	
Evaluation methods	Written examination (Partim A&B) + continuous assessment (Partim B)
Teaching methods	<ul style="list-style-type: none"> • Formal lectures • Seminar by experts • Reading of scientific papers • Problem based learning (Partim B)
Content	<p>Partim A - Introduction to renewable energy</p> <p>General introduction (energy outlook, energy efficiency, place of renewable energy) (3h)</p> <p>Solar energy (solar resource characterisation, photovoltaic effect, PV panels, Converters, etc.) (8h)</p> <p>Wind energy (mechanical aspects, Betz law, BEM, electrical aspects) (4h)</p> <p>Hydro power (types of turbines, efficiency, fluid aspects) (3h)</p> <p>Biomass (solar to biomass conversion, biomass composition, thermochemical conversion, biological conversion) (5h)</p> <p>Energy storage (electrical, mechanical, thermal) (3h)</p> <p>Partim B - Advanced topics in renewable energy</p> <p>Concentrated solar Power CSP / solar drying (4h-4h)</p> <p>Design and control of wind turbines (4h-4h)</p> <p>Design of a small hydraulic turbine (4h-4h)</p> <p>Mass and energy balance of biomass conversion routes (4h-4h)</p> <p>Design of an energy storage unit (4h-4h)</p>
Inline resources	Moodle
Faculty or entity in charge	ENVI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Environmental Bioengineering	BIRE2M	3		
Master [120] in Chemistry and Bioindustries	BIRC2M	3		