


3.00 crédits	30.0 h	Q1
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Enseignants	De Jaeger Emmanuel ;Gerin Patrick ;Jeanmart Hervé ;
Langue d'enseignement	Anglais
Lieu du cours	Louvain-la-Neuve
Préalables	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)
Thèmes abordés	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.
Acquis d'apprentissage	
Modes d'évaluation des acquis des étudiants	Written examination (Partim A&B) + continuous assessment (Partim B)
Méthodes d'enseignement	<ul style="list-style-type: none"> • Formal lectures • Seminar by experts • Reading of scientific papers • Problem based learning (Partim B)
Contenu	<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>
Ressources en ligne	Moodle
Faculté ou entité en charge:	ENVI

Programmes / formations proposant cette unité d'enseignement (UE)				
Intitulé du programme	Sigle	Crédits	Prérequis	Acquis d'apprentissage
Master [120] : bioingénieur en sciences et technologies de l'environnement	BIRE2M	3		
Master [120] : bioingénieur en chimie et bioindustries	BIRC2M	3		