

4.0 credits	30.0 h	1q
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Teacher(s) :	Gerin Patrick (coordinator) ; Draye Xavier ; Jeanmart Hervé ; Van Moeseke Geoffrey ;
Language :	Français
Place of the course	Louvain-la-Neuve
Prerequisites :	Introduction to thermodynamics
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.
Aims :	<p>At the end of this activity, the student is able to:</p> <ul style="list-style-type: none"> - Properly use energy units and know the orders of magnitude relative to the energy resources and global consumption; - Master the physical, chemical or biological principles underlying energy conversion technologies, and cite the parameters used in the equations that characterize the performance of conversion technologies, and the nature of their contribution in these equations; - Select or sort conversion technologies based on their relevance to the nature of the available energy resources and the desired useful final forms of energy; - Specify the orders of magnitude of conversion efficiencies and power scales that can be achieved by the main technologies and conversion pathways of renewable energy resources; - Point out the major issues addressed by policies that support the development of the exploitation of renewable energy sources; - Understand scientific papers and articles on specific topics in the field of renewable energy, critically exploit their content and develop an independent quantitative analysis; if necessary, identify, acquire and integrate new knowledge needed to carry out this analysis; - Synthesize and communicate orally and in writing this analysis, and defend it orally. <p><i>The contribution of this Teaching Unit to the development and command of the skills and learning outcomes of the programme(s) can be accessed at the end of this sheet, in the section entitled "Programmes/courses offering this Teaching Unit".</i></p>
Evaluation methods :	Written examination: problem solving, analysis and interpretation of specific situations. Written report on the personal essay.
Teaching methods :	Lectures and seminars by external professionals and by the students. Personal work of analysis of scientific documents, development of a personal subject and report writing.
Content :	<p>Lectures</p> <p>The course is based on lectures given by researchers or industrial actors involved in specific aspects of the renewable energy sector. The course content will focus on:</p> <ul style="list-style-type: none"> - Renewable energy: world energy context, global view - Solar, hydraulic, wind energies: background, climatic architecture, thermal and photovoltaic conversion of solar energy, wind and hydraulic energies. - Energy from biomass: background, photosynthesis, energy crops, thermochemical and biological conversions, - Life cycle assessment: example of biofuels. - Tools to support renewable energy production: case of green certificates <p>Personal work:</p> <p>Synthesis of bibliographic documents on a specific topic in the field of renewable energies. Critical analysis of the data and conclusions. In depth, quantitative, personal developmen on a question related to the topic. Presentation and oral defense of the work. Writing of a synthesis report.</p>
Bibliography :	Reference documents available on icampus.
Other infos :	Teaching team: Professors, researchers and industrial actors involved in specific aspects of the renewable energy sector
Cycle and year of study :	<p>> Master [120] in Electro-mechanical Engineering</p> <p>> Master [120] in Mechanical Engineering</p> <p>> Master [120] in Environmental Science and Management</p> <p>> Master [60] in Environmental Science and Management</p> <p>> Master [120] in Chemical and Materials Engineering</p>

Faculty or entity in charge:	ENVI
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