



The version you're consulting is not final. This course description may change. The final version will be published on 1st June.

5.00 credits

22.5 h + 30.0 h

Q2

Language :	English > French-friendly
Place of the course	Louvain-la-Neuve
Main themes	Chemistry and materials science and engineering, sustainable development, life cycle assessment, processing, recycling, social life cycle assessment of products, innovation
Learning outcomes	
Evaluation methods	<p>The students are evaluated by group and individually, both evaluations being continuously led. Group evaluation will involve grading at different times the deliverables produced by the group, including a final deliverable at the end of the project; the individual one will consist of a few short tests aiming to evaluate the acquisition of key concepts by each student; these tests may be written or oral. The final grade will be a combination of all grades acquired along the semester - there will be no final exam. In case the project is failed, individual tests can be passed again, and group deliverables can be improved if needed.</p> <p>The use of generative artificial intelligence for the production of (parts of) deliverables is allowed, provided this use be indicated to the teachers, done in a critical way, and compared to other sources.</p> <p>If, for one part of the continuous evaluation process, a student does not abide to the methodological instructions defined on moodle by the teachers, including the use of online resources and student collaborations, all the continuous evaluation will obtain a grade of 0.</p>
Teaching methods	The project is led in small groups of students. It involves the reading of a portfolio of review articles and book chapters related to the proposed case studies, the input of external experts, the simulation of processing paths, of materials/devices properties (when appropriate), the innovative design of alternative solutions, the management of a social life cycle assessment, the evaluation of economical impacts, the communication of their findings to adequate audiences.
Content	<p>As stated in a report of the UN Environment Programme¹, <i>"shared concerns about the state and sustainability of environmental, economic and social dimensions of today's and tomorrow's world are expressed through the concept of 'Sustainable Development'. The journey towards sustainability finds sustainable production and consumption at its very heart. It also relates to the social responsibility of organizations and the objective to improve social and environmental performances along with sustained economic profitability -all in the perspective to contribute notably to greater human well-being."</i></p> <p>Engineers, particularly in chemistry and materials science, have a key role to play when dealing with these constraints to turn them into opportunities. The project will aim at giving the opportunity to students to practice this concept of Sustainable Development. A large panel of scientific and technological challenges related to sustainable chemical and materials engineering will be considered.</p> <p>The project will focus on the assessment of case studies. Specific engineered solutions of chemical engineering and/or materials science used for specific problems / applications will be the starting points of the project. These case studies will be related to the processing, recycling or use of structural and/or functional materials or devices. In small groups, the students will have to carry out a life cycle assessment of the existing solution, to critically assess it and to propose alternative and innovative solutions taking into account social, environmental and economical constraints. Innovative eco-design will be actively considered. Seminars on specific topics will be organized. Evaluation of the potential economical and societal impacts of the proposed solution will have to be carried out, including wasting or recycling issues. Motivated presentations of the proposed solutions will have to be carried out.</p> <p>¹ UNEP, Guidelines for Social Life Cycle Assessment Of products, 2009</p>
Inline resources	All needed resources will be made available <i>via</i> the Moodle website of the project.
Other infos	All the course material will be available in the Moodle platform.
Faculty or entity in charge	EPL

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Environmental Bioengineering	BIRE2M	5		
Interdisciplinary Advanced Master in Science and Management of the Environment and Sustainable Development	ENVI2MC	5		
Master [120] in Chemistry and Bioindustries	BIRC2M	5		