UCLouvain

lmapr2021

2021

Societal challenges with polymers

5.00 credits	30.0 h + 22.5 h	Q2

This biannual learning is being organized in 2021-2022

Teacher(s)	Glinel Karine ;Jonas Alain ;Van Ruymbeke Evelyne ;
Language :	English
Place of the course	Louvain-la-Neuve
Prerequisites	The course requires basic knowledge of the physics and chemistry of polymers as given, for example, in the courses LMAPR2019 or LCHM1361.
Main themes	Physical and chemical properties of polymers, environmental and societal issues related to the use of polymers. More specifically, specific themes will be addressed through a series of debates on cutting-edge topics related to polymers. These topics will be subject to change based on current events. For example, these debates could address the following issues: - Bio-sourced polymer materials: a sustainable solution? - Towards greater biodegradability of polymer materials: is this realistic? - Micro-plastics and oceans: what to do? - Management of multi-component materials: what are the solutions? - Advantages and drawbacks of the use of nanoparticles in polymer materials - Can we do without plastics in agriculture / electronics / packaging / telecommunications / etc. - Plasticizers - to banish or tolerate? - Plastic and use of fossil resources - an infernal couple? - Life is based on macromolecules - why do not we?
Learning outcomes	**At the end of this learning unit, the student is able to :** **Contribution of the course to the program objectives** **Axis 1: 1.1, 1.3** To be able to confront different complex and contradictory information, to analyze them critically, and to combine a series of tools, concepts, reasoning to respond in a judicious and well-argued way to the problem. **Axis 2: 2.3** Be able to analyze and take into account a set of different criteria (efficiency, quality, safety, carbon footprint, recyclability, alternatives, ...) to determine the relevance of a process. **Axis 3: 3.1, 3.3** Document and summarize the state of current knowledge in the field. Synthesize this research work to propose solutions or alternatives to the problem. **Axis 4: 4.1, 4.2, 4.3, 4.4** Collectively organize the preparation of debates, be able to defend ideas before other actors from different points of view, organize the work to produce a quality report / video. **Axis 5: 5.2, 5.4, 5.6** Argue and convince others, analyze and use technical documents. **Axis6: 6.2** Discuss the relevance of a solution by looking beyond technical issues.
Evaluation methods	Students will be continuously evaluated, through their presentations, participation to discussions, and final reportage.
Teaching methods	The course will be organized in three teaching modules. The first two modules are concerned with a general theme, for which the students will receive reference supports (scientific articles, press releases, videos and podcasts, reports, expert presentations,...); from this, they will prepare a presentation that will be shared and discussed with the class. In the third module, the students will prepare a video reportage on the use of polymer materials for a specific range of applications, including a general view on this use, advantages and drawbacks of polymers for these applications, and possible solutions to the drawbacks.
Content	After a general introduction to the polymer materials landscape, with the participation of experts of the industry or NGOs active in the preservation of the nevironment, the course centers on two specific themes (see list above). Visits of industrial plants may be organized.

Inline resources	The course material will be on Moodle. The course is based on different sources of information: book chapters, scientific articles, articles and press releases, online videos and podcasts, reports, ...
Faculty or entity in charge	FYKI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Chemical and Materials Engineering	KIMA2M	5		