UCLouvain

lmapr2016

2020

Project in Polymer Science

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).

5 credits	0 h + 45.0 h	Q2

Teacher(s)	Fustin Charles-André ;Jonas Alain ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	The project is based on a real problem inspired from industry, from research, or from our socio-culturo-economical environment, in the field of polymers. The specific theme is defined every year. For instance, the students might receive a virtual budget allowing them to analyze a complex object ("reverse engineering"). The project could also consist in selecting a polymer material for a specific application. It might be related to the issue of recycling (including, e.g., chemical, mechanical, technical, economical and ecological aspects). It might center on the analysis of an emerging issue of interest to the general public. It might also explore an emerging application of polymer materials. In all cases, the project will help students to discover and use the main characterization techniques of polymer science and technology. It will contribute to have them learn how to analyze a complex issue, and to produce deliverables respecting precise specifications while respecting a quality-oriented methodology. Preferably, the deliverables should include the use of collaborative communication tools such as wikis, e-portfolios, etc.
Aims	**Contribution of the course to the program objectives** This course contributes to the development of the following learning outcomes : 2.1, 2.2, 2.3, 2.4, 3.1, 4.1, 4.2, 4.3, 4.4, 5.1, 5.2, 5.3, 5.4, 6.4, with variable emphasis on some of the learning outcomes depending on the specific project. **Specific learning outcomes of the course** 1 This course aims to have students facing practical problems related to the synthesis, the processing, the use and the life-cycle of polymer materials. The specific learning outcomes of the project vary yearly. The need to acquire new notions and concepts by a personal work, and to use and apply techniques not described in previous courses, is intrinsic to the project. At the end of this project, the students will have acquired a practical ability to handle problems related to research, quality control, selection, or customer management in the field of R&D or technical business, as would befit a young engineer or scientist hired by a polymer company. - - - - *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".*
Evaluation methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The course is not based on lectures, but on the personal work of students in groups supervised by a teacher. At the end of the project, the students will deliver a report in a professional modern way (website, or small movie, or scientific paper, or exhibition for a general public, or popularization scheme, or kit of scientific reach-out for kids, etc.). A significant fraction of the final note will be attributed to this achievement; the rest is graded based on the work done and on a private discussion with the teachers.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** Project-based learning.
Content	The content of the project varies yearly but rests since 2014 on additive manufacturing. Students in groups imagine a complex object containing a series of polymer materials (a model of a car in 2014, a prosthesis in 2015, a quadricopter drone in 2016, a manipulation tool in 2017), make a computer-assisted drawing of this object, and 3D-print it (by fused deposition modelling). The students have to select the materials based on readings and experiments made in the laboratory, using a vast range of advanced techniques for which they have a virtual budget. They report their work using modern communication tools. The project requires to develop strategies for the management and coordination of a complex project involving ca. 10 participants.
Inline resources	Testimonies from a previous project: https://podcast.uclouvain.be/k3qZpMIsrh Web site of the project in 2018: https://moodleucl.uclouvain.be/course/view.php?id=11696 Web site made by the students in 2017: https://greglbr.wixsite.com/projectpolymer2017

Bibliography	Les documents nécessaires sont actualisés d'année en année, selon le projet; ils sont mis à disposition des étudiants sur le site internet du cours. The required documents are updated yearly, depending on the project. They are made available on the web site of the course.
Other infos	It is highly recommended to have attended an introductory course on polymer physics and chemistry.
Faculty or entity in charge	FYKI

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Chemistry	CHIM2M	5		
Master [120] in Chemical and Materials Engineering	KIMA2M	5		
Master [120] in Chemistry and Bioindustries	BIRC2M	5		