UCLouvain

lmapr2012

2019

Macromolecular Nanotechnology

In view of the health context linked to the spread of the coronavirus, the methods of organisation and evaluation of the learning units could be adapted in different situations; these possible new methods have been - or will be - communicated by the teachers to the students.

5 credits	45.0 h + 15.0 h	Q2

Teacher(s)	Demoustier Sophie ;Glinel Karine ;Glinel Karine (compensates Nysten Bernard) ;Gohy Jean-François ;Nysten Bernard ;
Language :	English
Place of the course	Louvain-la-Neuve
Main themes	The proposed themes for this course are, among others, in relationship with nano-fabrication techniques (templated synthesis methods, (soft) lithographies, '), organic thin films and self-assembled monolayers, the application of block-copolymers in nanotechnology, polymer brushes, smart surfaces and nano-objects, applications in biomedicine or organic electronics, characterisation techniques at the nanoscale, ...
Aims	**Contribution of the course to the program objectives** At the end of the course, the student will be able to : • search for information, scientific papers in order to understand a scientific or technological subject and to prepare a report or a presentation on it (axes 3.1, 3.3, 5.4); • write a didactic report for scientists or engineers on a scientific or technological subject (axes 3.3, 5.3, 5.5); • prepare and present a seminar for scientists or engineers on a scientific or technological subject(axes 5.6); • organise themselve and work in group to respect short term deadlines (axes 4.2, 4.4). 1 **Specific learning outcomes of the course** At the end of the course, the student will be able to • identify, describe and explain de techniques of nano-fabrication (nanolithography), of surface modifications, of synthesis of nano-objects, '; • identify, describe and explain the applications of organic nanostructures in the domains of materials science, organic electronics, biomedical engineering, '; • identify, describe and explain the main characterization techniques used in macromolecular nanotechnology; • make and justify the choice of a nano-fabrication, synthesis or functionalization technique for the conception or fabrication of an organic nanomaterial; • read, summarize, understand and criticize a scientific paper on a subject in relationship with one of the themes of macromolecular nanotechnology. - - - - *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.** Students are evaluated on the basis of 1. their work during the semester and 2. a final examination. The evaluation of the work of the semester is based on the group presentations, reports and laboratories, and on the presence and activity during the whole semester. The final evaluation is an oral examination. It is based on the reading, understanding and criticism of a scientific paper dealing with one of the themes of macromolecular nanotechnology presented during the semester.
Teaching methods	**Due to the COVID-19 crisis, the information in this section is particularly likely to change.** The course is based on projects and laboratories. During the semester, students in groups of three (or four), study, on the basis of the documents provided by the teachers and on their own bibliographic research, three topics selected by the teachers. Each topic is studied during two or three weeks. At the end of each period, all the groups hand in reports and some groups, selected by the teachers, present a 10 or 20 min seminar, according to the teacher's recommendations. Each group performs a laboratory related to the macromolecular nanotechnology during the semester and hands in a report.

Content	Projects, laboratories, seminars on the proposed themes.
Inline resources	https://moodleucl.uclouvain.be/course/view.php?id=8980
Bibliography	Chapitres de livres, articles de revue, articles scientifiques, rapports des groupes. Tous ces documents sont mis à disposition sur Moodle. Book chapters, reviews, scientific articles and reports done by the groups. All the documents are available via Moodle.
Other infos	It is highly recommended to have attended to the LMAPR2019 'Polymer Science and Engineering' or equivalent course.
Faculty or entity in charge	FYKI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Master [120] in Biomedical Engineering	GBIO2M	5		
Master [120] in Physical Engineering	FYAP2M	5		
Master [120] in Chemistry	CHIM2M	4		
Master [120] in Chemical and Materials Engineering	KIMA2M	5		