UCL Université catholique de Louvain

LMAPR2012

2016-2017

Macromolecular Nanotechnology

5.0 credits	45.0 h + 15.0 h	2q

Teacher(s) :	Demoustier Sophie (compensates Nysten Bernard) ; Gohy Jean-François (compensates Nysten Bernard) ; Nysten Bernard ; Demoustier Sophie ; Gohy Jean-François ; Gohy Jean-François (compensates Glinel Karine) ; Demoustier Sophie (compensates Glinel Karine) ; Glinel Karine ;
Language :	Anglais
Place of the course	Louvain-la-Neuve
Inline resources:	> https://moodleucl.uclouvain.be/course/view.php?id=8980
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). 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 :	Students are evaluated on the basis of -- their work during the semester and -- 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 :	The course is based on projects and laboratories. During the semester, students, in groups of 3 (or 4), study, on the basis of the documents given by the teachers and on their own bibliographic research, a given theme or make a laboratory during 2 or 3 weeks. At the end of this period, some groups present a 20 minutes seminar; all groups hand in reports.

Content :	Projects, laboratories, seminars on the proposed themes.
Bibliography :	Book chapters, review articles, scientific articles, group reports on projects and laboratories. All the documents are available on 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 / formations proposant cette unité d'enseignement (UE)

Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Chemical and Materials Engineering	KIMA2M	5	-	
Master [120] in Biomedical Engineering	GBIO2M	5	-	
Master [120] in Physical Engineering	FYAP2M	5	-	
Master [120] in Electrical Engineering	ELEC2M	5	-	
Master [120] in Chemistry	CHIM2M	4	-	