UCL Université catholique de Louvain

LBIRC2102

2015-2016

Organic analysis II

7.0 credits	45.0 h + 30.0 h	2q

Teacher(s) :	Herent Marie-France ; Robiette Raphaël ; Collin Sonia (coordinator) ;
Language :	Français
Place of the course	Louvain-la-Neuve
Inline resources:	Icampus
Prerequisites :	LBIR1318
Main themes :	General description of 4 main spectroscopic techniques used in organic analysis: mass spectrometry, nuclear magnetic resonance (proton and carbon), infrared and UV-visible. For each of them are described the basic principles, analytical information which can be used, examples of applications in organic analysis, and the equipment. Seminars and practical classes allow the student to develop a strategy for the identification of organic compounds.
Aims :	The course contributes to the following learning outcomes : 1.1, 1.3, 1.4, 1.5 + 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9 + 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9 (BIRC21) At the end of this course, the student will be able to : - analyse mass, UV, NMR and IR spectra of organic compounds belonging to the main chemical families, - develop new protocols for qualitative and quantitative analyses of organic compounds, taking into account the complexity of the matrix (optimal association of extraction procedures, chromatographic analyses and detection techniques), - orally present his results. *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 :	Written examination for the theoretical aspects. The experimental know-how and the attitude are evaluated throughout practical classes, as well as by an oral presentation (English) and a report miming the writing of a publication.
Teaching methods :	Magistral lectures for the theoretical part. Seminars allow to use the new concepts, by analyzing MS (EI, CI, ESI, APCI), NMR, IR and UV-visible spectra. At the laboratory, the student is put in the situation of a researcher, in front of a new problem.
Content :	Theoretical course (3 ECTS). General description of the main spectroscopies. Mass spectrometry: basic principles, analytical information, applications for saturated and unsaturated hydrocarbons, aromatics, alcohols, carbonyles, carboxylic acids and esters, systems of introduction, ionization modes, systems of deflection. Nuclear magnetic resonance: basic principles, chemical shift for H and C, coupling constants, intramolecular mobility, longitudinal and transversal relaxations. Infrared spectrometry: conditions of absorption and modes of vibration, applications for alcanes, alcenes, aromatics, alcohols, carbonyles, halogenic compounds. UV-visible spectroscopy: diagram of Jablonski and types of transitions, applications for alcenes, carbonyles, benzene, solvent effect, equipment - Seminars (2 ECTS). Development of a strategy for the identification of organic compounds by using combined information (NMR, MS, IR and UV). - Experimental laboratories (2 ECTS). Research activities in which the use of HPLC-UV-MS or GC-MS techniques allows the quantification of organic molecules within a complex matrix.
Bibliography :	No particular supports are considered compulsory.
Faculty or entity in charge:	AGRO

Programmes / formations proposant cette unité d'enseignement (UE)				
Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Master [120] in Chemistry and Bioindustries	BIRC2M	7	-	