UCLouvain

lbirc2102

2026

Spectroscopic methods of analysis - Organic analysis II

5.00 credits	45.0 h + 7.5 h	Q1

Teacher(s)	Dumitru Andra ;Herent Marie-France ;Robiette Raphaël (coordinator) ;
Language :	French
Place of the course	Louvain-la-Neuve
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.
Learning outcomes	**At the end of this learning unit, the student is able to :** 1 The course contributes to the following learning outcomes : 1.1, 1.3, 1.4, 1.5 + 3.4, 3.6, 3.7, 3.8 + 6.3 (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.
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. General description of the main spectroscopies and spectrometries. 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 1H and 13C, multiplicity of signals, coupling constants, solvent effects, 2D NMR. 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.
Inline resources	Moodle
Bibliography	Le cours ne fait appel à aucun support particulier qui serait payant et jugé obligatoire
Other infos	This course can be given in english.
Faculty or entity in charge	AGRO

Programmes containing this learning unit (UE)

Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Chemistry and Bioindustries	BIRC2M	5		