UCLouvain

lfyki1203

2026

Organic Chemistry for (Bio-)Materials

5.00 credits	30.0 h + 30.0 h	Q1

Teacher(s)	Demoustier Sophie ;Glinel Karine ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	**LEPL 1301** (Chemistry and Physical Chemistry 1) or equivalent course **LEPL 1302** (Chemistry and Physical Chemistry 2) or equivalent course
Main themes	This course aims to introduce the fundamentals of organic chemistry and illustrates its key role in everyday life, materials science (polymers and organic materials), and life sciences (biopolymers, biochemistry, and biomaterials). The topics covered are as follows: • Fundamental concepts required for a good understanding of the structure and reactivity of organic molecules and macromolecules. • The chemical behavior of the main families of organic compounds, illustrating the relationships between the structure of a functional group, its properties, and its reactivity. • Organic biological and synthetic materials: from chemistry to functional properties. • Introduction to the fundamental concepts of green chemistry and sustainable approaches to materials synthesis.
Learning outcomes	**At the end of this learning unit, the student is able to :** **Contribution of the course to the program's learning outcomes** With regard to the learning outcomes of the “Bachelor in Engineering” program, this course contributes to the development and acquisition of the following learning outcomes: • AA 1.1 : Apply concepts, laws, and reasoning to a disciplinary problem of framed complexity. **Specific learning outcomes for the course** At the end of this course, students will be able to: • understand the basics of the structure of organic compounds; • Identify the different types of reagents (nucleophiles, electrophiles, radicals, acids, and bases). • recognize and depict the functional group(s) of the main families of organic compounds; • understand and explain the structure and reactivity of organic molecules relevant to biological materials and systems; • understand and explain how basic organic constituents determine certain properties of biological and synthetic macromolecules; • understand and explain the fundamental concepts of green chemistry and the main strategies for minimizing the environmental impact of organic material synthesis.
Teaching methods	The course is based on lectures, exercise sessions, and practical work in the laboratory or classroom demonstrations.
Content	**Fundamental concepts** • Structure, bonds, and geometry of organic molecules; isomerism. • Categories of reagents; electronic effects; reaction intermediates. **Structure and reactivity of some functional groups** • Alkenes, halogenated compounds, alcohols, thiols, aldehydes and ketones, carboxylic acids and derivatives, amines and derivatives. **Biological materials: the building blocks of life** • Sugars, lipids, amino acids, peptides, and proteins, nucleic acids. • Structure and biological functions of these molecules. • Examples of key organic reactions in metabolism. **Synthetic organic materials** • Introduction to organic polymer synthesis. • Introduction to the fundamental concepts of green chemistry and sustainable approaches

Bibliography	A définir ultérieurement par les enseignants nommés
Faculty or entity in charge	FYKI

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Specialization track in Biomedical Engineering	FILGBIO	5		
Minor in Applied Chemistry and Physics	MINOFYKI	5		
Specialization track in Applied Chemistry and Physics	FILFYKI	5		
Mineure Polytechnique	MINPOLY	5		