

Due to the COVID-19 crisis, the information below is subject to change, in particular that concerning the teaching mode (presential, distance or in a comodal or hybrid format).


4 credits

30.0 h + 22.5 h

Q1

Teacher(s)	Riant Olivier ;
Language :	French
Place of the course	Louvain-la-Neuve
Prerequisites	<i>The prerequisite(s) for this Teaching Unit (Unité d'enseignement – UE) for the programmes/courses that offer this Teaching Unit are specified at the end of this sheet.</i>
Main themes	<p>The thermodynamic and kinetic aspects will be re-introduced and supplemented by the notions of control of a reaction (Hammond's postulate, kinetic vs thermodynamic control).</p> <p>Electronic effects will also be reviewed and related to the concepts of charge stabilization and acid-base properties of certain classes of organic functions.</p> <p>The HSAB concept will also be introduced and linked to the concepts of electronegativity and polarizability.</p> <p>These principles will be applied to the chemistry of aromatics and the notions of orientation in electrophilic aromatic substitution reactions will be developed and applied in concrete problems of everyday life (paracetamol, ibuprofen, ...).</p> <p>The chemistry of nitrogen compounds will introduce the large classes of functions carrying these heteroatoms and their existence in the field of biological molecules (DNA, peptides, ATP, ...). The deepening of mechanisms and notions of orientation and selectivity will be done by studying the large classes of reaction related to the chemistry of these heteroatoms. The interconversions between nitrogen functional groups will be supplemented by the notions of organic reagents carrying a heteroatom.</p> <p>The notion of organic synthesis for the construction of a molecule will also be used to illustrate the course in different areas of everyday life.</p> <ul style="list-style-type: none"> • Introduction to the notion of carbanions. • Physico-chemistry and structures. • Stabilization effects. <p>The chemistry of enolates and related carbanions will be reintroduced and deepened in aspects of preparation, reactivity and selectivity.</p> <ul style="list-style-type: none"> • Alkylation reactions, aldol condensation and Michael's reaction. • Unstabilized organometallic chemistry. • Organomagnesiums, organoliths and organocuprates. • Base-nucleophilic duality. • Application in carbon-carbon bond creation reactions. • Comparisons between different families of organometallics.
Aims	<p>In the continuation of the first-year organic chemistry course, the focus will be on deepening the basic principles of chemical reactivity applied to organic chemistry.</p> <p>The course will be divided into three major complementary parts.</p> <p>In the first part, the notions of control, orientation and electronic effects will be introduced and applied in the chemistry of aromatic compounds.</p> <p>The second part of the course will be devoted to the description of the chemistry of fundamental heteroatoms (nitrogen, phosphorus and sulfur). Major classes of biological molecules and biochemical mechanisms will serve as examples to link matter to life.</p> <p>The last part proposes a complete teaching of carbanion chemistry and organometallic compounds related to this class of compounds.</p> <p>The aim here is to focus student training on the major carbon-carbon bond formation reactions through the use of organometallics and related carbanions. This course is also an opportunity to focus the applications towards the aspects of selectivity (regioselectivity, stereoselectivity) essential to the learning of organic synthesis.</p> <p>-----</p>

	<i>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".</i>
Bibliography	<ul style="list-style-type: none">• Chimie organique, P. Bruice – Pearson 2^e Edition• Organic Chemistry, Clayden
Faculty or entity in charge	CHIM

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Aims
Bachelor in Bioengineering	BIR1BA	4	LCHM1141B	
Bachelor in Chemistry	CHIM1BA	4	LCHM1111 AND LCHM1141	