

4.0 credits

30.0 h + 15.0 h

2q

Teacher(s) :	Demoustier Sophie ; Elias Benjamin ;
Language :	Français
Place of the course	Louvain-la-Neuve
Inline resources:	<a href="http://icampus.uclouvain.be/claroline/course/index.php?cid=LMAPR1230">http://icampus.uclouvain.be/claroline/course/index.php?cid=LMAPR1230</a>
Main themes :	The course is divided in two parts. The first part deals with 'generalities' required for a good comprehension of the reactivity in organic chemistry, namely the reasons why organic compounds do or do not react in given conditions. The second part describes the chemical behaviour of the main organic compounds, illustrating the relationships between the structure of a given functional group and its reactivity. The lessons will be frequently illustrated with examples from other disciplines such as materials science and life sciences. The third part consists in an introduction to chemical processes and addresses the thermodynamics of phase equilibria (liquid-liquid and liquid-gas). This part of the course also describes some practical applications of phase equilibria, such as liquid-liquid extraction or the fractional distillation.
Aims :	<p>Contribution of the course to the program objectives</p> <p>Regarding the learning outcomes of the program of Bachelor in Engineering Sciences, this course contributes to the development and the acquisition of the following learning outcomes:</p> <p>--</p> <p>LO 1.1 : Apply concepts, laws, reasoning to disciplinary reduced problems.</p> <p>Specific learning outcomes of the course</p> <p>At the end of the course, the student will be able to:</p> <p>--</p> <p>distinguish the different types of isomers (structure and geometrical isomers and stereoisomers) ;</p> <p>--</p> <p>recognize the different types of reactants (nucleophiles, electrophiles, radicals, acids and bases) ;</p> <p>--</p> <p>describe the electrons migration within an organic molecule (inductive and conjugation effects) as well as during a chemical reaction between two given compounds</p> <p>--</p> <p>recognize and represent the main functional groups of organic compounds ;</p> <p>--</p> <p>establish relations between molecular and spatial structures of organic molecules and some properties, in particular, their reactivity ;</p> <p>--</p> <p>predict and explain the expected result for the main types of organic reactions, including their mechanism.</p> <p>--</p> <p>describe phase diagrams and explain their utility in solving a certain number of problems encountered in the processing industry.</p> <p>--</p> <p>Explain the functioning principle of different separation techniques and describe the important operating parameters that influence their operation.</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></p>
Evaluation methods :	Students are evaluated through a final written examination
Teaching methods :	The course is based on lectures and exercises-based learning
Content :	<p>Part 1</p> <ol style="list-style-type: none"> <li>1. Structure, chemical bonds and geometry of organic molecules</li> <li>2. Isomerism</li> <li>3. Reactivity in organic chemistry (energy diagrams, intermediates, types of reactants, electronic effects)</li> </ol> <p>Part 2</p> <ol style="list-style-type: none"> <li>4. Alkanes , alkenes and alkynes</li> <li>5. Alkyl halides</li> <li>6. Aromatic compounds</li> <li>7. Alcohols, thiols, ethers and epoxydes</li> <li>8. Aldehydes and ketones</li> <li>9. Carboxylic acids and their derivatives</li> <li>10. Amines and their derivatives</li> </ol> <p>Part 3</p>

	<p>11. Phase equilibria : real systems with one or several constituents                  12. Practical applications of phase equilibria</p>
Bibliography :	<p>The slides presented during the lectures and the exercices are available on i-campus.                  Recommended reference books :                  --                  L. Craine, D. Hart, C. Hadad, Chimie Organique 1 et 2, Dunod, 2008                  --                  D. Klein, Organic Chemistry, Wiley, 2011</p>
Cycle and year of study :	<p><a href="#">&gt; Bachelor in Engineering</a>  <a href="#">&gt; Master [120] in Biomedical Engineering</a></p>
Faculty or entity in charge:	<p>FYKI</p>