

5.00 credits

45.0 h

Q2

Teacher(s)	Fustin Charles-André ;Vlad Alexandru ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	<p>This course describes the basic principles of materials chemistry, extending the concepts seen in previous courses (organic, inorganic, physical and polymer chemistry) and exploring the essential role it plays in many fields. The main topics covered are: theoretical notions (electronic structure, vibration, conduction), properties of materials in relation to their composition and structure, structuring of materials at different scales, and the major families of materials.</p> <p>Examples of applications will illustrate each of these points.</p>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p>This course serves to introduce important concepts and notions in the field of materials chemistry. The objectives of this course are to :</p> <ol style="list-style-type: none"> <li>1. familiarize students with the different families of materials and the various synthetic methods related to them;</li> <li>2. provide students with the ability to explain and rationalize the properties of a wide range of materials and to establish composition-structure-property relationships; and</li> <li>3. to illustrate the importance of materials chemistry for many fields and applications, in particular for current societal challenges (energy, environment, health,..).</li> </ol>
Evaluation methods	<p>Students are evaluated on the basis of a single written exam covering all the material covered by the different teachers.</p> <p>The questions can be of different types : open questions, MCQ,...</p>
Teaching methods	The course is given mainly on the blackboard using powerpoint slides.
Content	<p>The course consists of two main parts : one part dealing with inorganic materials and one part dealing with organic materials.</p> <p>Each part will present different types of materials and their methods of synthesis. Typical properties (electronic, ionic, thermal, dielectric, mechanical, ...) of these classes of materials will also be discussed. Throughout the course, illustrations of their applications will be presented.</p> <p>The inorganic part of the course will include the following classes of materials: metals and alloys, ceramics, crystalline and amorphous materials, and hybrid composites.</p> <p>The organic part will cover the following materials: biopolymers, conducting polymers and organic electronics, liquid crystals, polymer blends and composites.</p>
Inline resources	A copy of the slides will be posted on Moodle.
Faculty or entity in charge	CHIM

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Chemistry	CHIM1BA	5		