



5.00 credits

50.0 h + 10.0 h

Q1

Teacher(s)	Filinchuk Yaroslav ;
Language :	French
Place of the course	Louvain-la-Neuve
Main themes	The course aims to teach students the fundamentals of Inorganic Chemistry so that they can understand the specialized language used, the states of matter, the relationship between nature, structure and the properties of inorganic compounds, chemical balances in the aqueous phase (acid-base reactions, oxide-reduction reactions and precipitation reactions) and to show how they are linked to thermodynamics and chemical reaction kinetics.
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <p>1 The general objectives of this Chemistry course are to teach students the basic concepts of Chemistry and thus enable them to master the specialized language, understand the organisation of matter and the chemical transformations it can undergo and acquire an understanding of concepts applied in fields such as Metallurgy and Electrochemistry.</p>
Evaluation methods	<p><b>Skills to be acquired:</b> Understanding the basics of general chemistry, structure and properties of matter, chemical reactions and importance of chemistry in many areas.</p> <p><b>Evaluation:</b> - There is a written exam counting for 20 points. These are basically the exercises applied to the theoretical course. These exercises are of the same style as those made in exercise sessions during the year. Theoretical questions also make a part of the examination.- The mid-term examination provides 1 point to the final examination score. The result of the mid-term examination is transferred to the June and August exam sessions but not to the next academic year.</p>
Teaching methods	The course is taught with the use of PowerPoint slides, available at Moodle. Exercises are provided to facilitate the understanding. The course will be illustrated with examples taken from everyday life in the living world and in industry.
Content	Fundamental concepts of chemistry. Introduction to the periodic table. Stoichiometry, concentration. The gas laws. Energy, heat, thermochemistry; the first law of thermodynamics, enthalpy. Quantum numbers, orbitals. Chemical bonds: ionic, covalent, intermolecular. Molecular geometry, hybridization of orbitals. The rate and the mechanism of reactions, influence of catalysts. Chemical equilibrium, predicting the direction of a reaction; equilibrium constant. Chemical reactions in solution, strong and weak electrolytes. Acid-base reactions, pH and concentration of hydronium ions; titration. Solubility and precipitation, the solubility product, the common-ion effect. Oxidation and reduction, redox equations. Introduction to electrochemistry, electrochemical cells and electrolysis.
Bibliography	<p>Un livre de référence est conseillé:</p> <p>- <b>Principes de chimie, une approche moléculaire</b>, Nivaldo Tro, une adaptation de Eveline Clair, Julie Vézina, Pearson Education, 2015.</p> <p>Un autre livre peut être aussi recommandé:</p> <p>- Principes de chimie, Atkins, Jones, Laverman, de Boeck, 4eme édition, 2017.</p>
Other infos	<p>Teaching material:</p> <p>- Slides of the presentations (available online on Moodle)</p> <p>- The exercices workbook (available online on Moodle) - The book "Principes de chimie, une approche moléculaire", Nivaldo Tro, une adaptation de Eveline Clair, Julie Vézina, Pearson Education, 2015 (ISBN 978-2-7613-7248-0).</p>
Faculty or entity in charge	ESPO

<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Environmental Science and Management	ENVI2M	5		
Interdisciplinary Advanced Master in Science and Management of the Environment and Sustainable Development	ENVI2MC	5		
Bachelor : Business Engineering	INGE1BA	5		