

2.00 credits

20.0 h

Q1

Language :	French
Place of the course	Louvain-la-Neuve
Main themes	<p>The course will be divided into two parts:1. Structural biochemistry:- patterns and forms in protein structures (observation, manipulation, description, classification)- principles of protein folding - domains and assemblies (modular nature of proteins, multi-protein complexes)- bioinformatics in structural biology- interactions between biomolecules (methods and characterization)2. Enzymology- principles of enzyme catalysis (Michaelis Menten, steady state kinetics, reaction schemes)- the basics of chemical catalysis by proteins (catalysis by amino acids lateral chains, active site complementarity, entropic catalysis, transition state stabilisation)- control of enzyme activity (inhibition, activation, cooperativity, allosterism, environmental effects)</p>
Learning outcomes	
Evaluation methods	<p>The course is divided into three modules. Each module will be evaluated during the course of the quadrimester in the form of a dispensatory test. Exemption is awarded at 12/20.</p> <p>A written exam will be organized in session for students who have not passed the tests during the quadrimester.</p> <p>Practical courses are mandatory. Report on practical courses is mandatory.</p>
Teaching methods	Ex cathedra lectures
Content	<p>About 36 hours will be dedicated to lectures with the help of PowerPoint slides. 6 hours will be organized in computer room for exercises or guided tours of various websites. The course is composed of three main chapters:</p> <p>Chapter 1. Amino acids side chains: - hydrophobicity/hydrophilicity - electrostatic and acido-basic properties - nucleophilicity - redox properties. Structural biochemistry: - biomolecule structures and interactions: non covalent driving forces and quantitative aspects - thermodynamical and chemical stability of proteins - protein folding : from molecular mechanisms to conformational diseases - observation, manipulation, visualisation, description and classification of three-dimensional structures (in computer room)</p> <p>Chapter 2: structural biology of membrane proteins</p> <p>Chapter 3. Enzymology - principles of enzyme catalysis (Michaelis Menten, steady state kinetics, reaction schemes) - the basics of chemical catalysis by proteins (catalysis by amino acids lateral chains, active site complementarity, entropic catalysis, transition state stabilisation) - cofactors and coenzymes chemistries - control of enzyme activity (inhibition, activation, cooperativity, allosterism, environmental effects) - numerical simulation of enzymatic catalysis (in computer room)</p>
Inline resources	All documents are available via Moodle
Other infos	Precursory courses: Basics in biochemistry (e.g. Elements of biochemistry CHM1271)
Faculty or entity in charge	BIOL

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Master [120] in Chemistry and Bioindustries	BIRC2M	2		