


4.0 credits	30.0 h + 15.0 h	2q
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Teacher(s) :	Larondelle Yvan (coordinator) ; Ghislain Michel ;
Language :	Français
Place of the course	Louvain-la-Neuve
Inline resources:	iCampus
Prerequisites :	Course of general biology and basic knowledge of organic chemistry <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 :	Structural biochemistry is a branch of biochemistry concerned with the molecular structure of macromolecules within living cells. Enzymology is the study of the macromolecules acting as catalysts for the processes that sustain life, in particular their structure, kinetics and function. Molecular biology focuses on deciphering the interactions between DNA, RNA and protein, which are responsible for DNA replication, gene expression and protein biosynthesis. These disciplines aim at understanding the activity of whole organisms through the study of the chemical processes that occur within living cells.
Aims :	a. Contribution de l'activité au référentiel AA (AA du programme) 1.1 ; 1.3 3.2 ; 3.4 ; 3.6 ; 3.7 ; 3.8 6.5  b. Topic learning goals At the end of this course, students will be able to explain the molecular basis of living organisms using appropriate terminology, and to identify suitable protein analysis systems. In particular they will be able to : - List the different classes of biomolecules and their links within the cell's processes and structures - Describe the physico-chemical characteristics and properties of the biomolecules - Explain the role of enzymes in the catalysis of chemical reactions and their regulation - Use the information to address a simple, theoretical question, related to the biotechnology field - Design an experimental approach for the study of proteins - Communicate orally and in writing, using scientific terminology and representation tools (graphics, tables or schemes) <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>
Evaluation methods :	The written examination consists of a series of questions that require concise or detailed answers and problems solving ability. The performance developed during the laboratory training sessions are evaluated independently, via the laboratory report.
Teaching methods :	Lectures will be given in a classroom. They consist of ex cathedra speeches and solved problems. The laboratory sessions aim at developing a scientific reasoning behaviour and improving classroom communication skills. Students are given a detailed evaluation of their performance.
Content :	The course consists of lecture parts (A-D) and laboratory training sessions. - A. Introduction dealing with the molecular bases of whole organisms : hierarchical organization of biological structures ; metabolism and energetics, the role of water - B. Biomolecules : classification, structure, properties and functions of amino acids, proteins, glucides, lipids, nucleic acids ; tridimensional structure of protein and purification techniques ; association of the biomolecules with the cell wall or membranes. - C. Enzymology: classification, kinetics and catalysis mechanism, regulation of enzyme's activity. - D. Fundamental molecular biology: DNA replication, transcription, translation. - Theoretical concepts underlying enzyme catalysis, protein electrophoresis and purification will be illustrated during the laboratory training sessions.
Bibliography :	Syllabus, slides shown in classroom and laboratory notes will be available via icampus. This course is based on the reference book 'Lehninger Principles of Biochemistry' (ed Freeman). However the purchase of this book is not required.
Other infos :	Students enrolled in the Bachelor in Engineering program will earn one more credit unit. The students whose program does not include a course in basic organic chemistry are strongly encouraged to read selected chapters from a chosen textbook.
Faculty or entity in charge:	AGRO

<b>Programmes / formations proposant cette unité d'enseignement (UE)</b>				
Intitulé du programme	Sigle	Credits	Prerequis	Acquis d'apprentissage
Minor in Scientific Culture	<a href="#">LCUSC100I</a>	4	-	
Bachelor in Bioengineering	<a href="#">BIR1BA</a>	4	<a href="#">LCHM1141</a> and <a href="#">LBIR1150</a>	