

The version you're consulting is not final. This course description may change. The final version will be published on 1st June.

5.00 credits

30.0 h + 30.0 h

Q1



**This learning unit is not open to incoming exchange students!**

Language :	French
Place of the course	Charleroi
Prerequisites	<p>LSINC1131 and LSINC1132</p> <p>This course assumes that you have acquired the basic notions of biology and chemistry:</p> <p>General necessary prerequisites of Biology:</p> <p>General Biology course as described in the EU "Biology", in particular the chapters dedicated to the molecules of life</p> <p>Necessary general prerequisites of Chemistry:</p> <p>Atomic orbitals, chemical bonds, the structure of water and its properties, pH and osmolarity, redox potentials, functional groups of living organisms and the properties they confer on a carbon molecule.</p> <p>Chemical reactions: basic principles (stoichiometry, equilibrium, free energy), condensation/polymerization reactions, oxidation-reduction.</p>
Main themes	<p>This teaching unit revolves around</p> <ol style="list-style-type: none"> <li>1) proteins in general (structure-function relationship, enzymatic activity, regulations, proteomics),</li> <li>2) notions of metabolism</li> </ol>
Learning outcomes	<p><b>At the end of this learning unit, the student is able to :</b></p> <ul style="list-style-type: none"> <li>• perceive the structure-function relationship at the protein level</li> <li>• understand the role of enzymes in the catalysis of chemical reactions and understand the significance of the classic enzymatic parameters characterizing an enzyme</li> <li>• perceive the different levels of regulation making it possible to adjust the abundance and activity of an enzyme in a particular cellular context</li> <li>• understand what homeostasis means and the basic principles of cellular metabolism</li> <li>• perceive the interconnections between the different metabolic pathways addressed, and the significance of changes in metabolite abundance</li> </ul>
Teaching methods	<p>Mainly classic face-to-face teaching: blackboard + power point</p> <p>Illustration of the concepts during the exercise sessions</p>
Content	<p><b>Part I: proteins</b></p> <p>The biochemistry course introduces the basic concepts of biochemistry at the level of the structure of proteins in relation to their function, highlighting the mechanisms implemented to explain the exceptional properties of enzymes, namely an extremely high catalytic power and a very high specificity. These properties give living things their remarkable mastery of matter and energy. The basics of enzyme activity and enzyme kinetics covered, as well as various modes of regulation of enzyme activity.</p> <ol style="list-style-type: none"> <li>1. Introduction</li> <li>2. Amino acids</li> <li>3. Peptides</li> <li>4. Structure of proteins</li> <li>5. Enzyme activity and kinetics</li> <li>6. Regulations of enzyme activity</li> </ol> <p><b>Part II: Metabolism</b></p> <p>Metabolic pathways related to glucose catabolism are studied: glycolysis, Krebs cycle and phosphorylating oxidations. The focus is on enzyme regulation in a metabolic context.</p> <ol style="list-style-type: none"> <li>1. Metabolism Overview</li> <li>2. Glycolysis</li> <li>3. Krebs cycle</li> <li>4. OXPHOS</li> </ol>

Faculty or entity in charge	SINC
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<b>Programmes containing this learning unit (UE)</b>				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Additional module in life sciences and health for computer scientists	APPSCVS	5		