UCLouvain

lsinc1132

2023

General biology

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	This course assumes that you have acquired the basic notions of high school biology and chemistry: General necessary prerequisites of Biology: Descriptive cell biology: organelles (structure and functions); modes of cell division: mitosis and meiosis Necessary general prerequisites of Chemistry: Atomic orbitals, chemical bonds, pH and osmolarity, the structure of water and its properties, the functional groups of living organisms and the properties they confer on a carbon molecule, condensation/ polymerization reactions, oxido- reduction,…
Main themes	Give a general biology base to students coming out of high school but with a stronger and faster orientation in terms of their awareness of the complexity and the masses of data generated and a stronger emphasis on: Notion of sequences and comparison of sequences, notions of complexity-high throughput and focus on systems biology (which is the basis of the various OMICs). Proteins (structure, folding, impact of mutations) and their functions Gene expression and examples of genetic diseases Notions of evolution at the molecular level Definition of synthetic biology
Learning outcomes	**At the end of this learning unit, the student is able to :** - perceive the complexity of living things and the need to process "big data" - identify mutations and understand their possible impacts to understand evolution at the molecular level - focus on molecules and biomolecules which are polymers that can be analyzed by alignment and sequence processing software - identify biomolecules and their ability to react and interact . -Understand the basic principles of intercellular communication and signaling (signal transduction) in a cell Students will have developed methodological and operational skills. In particular, they will have developed their ability to: - Understand the complexity of life and the need to apply statistical and computer tools for the processing of experimental data generated by technologies commonly used in modern life sciences.
Evaluation methods	3 mandatory practical sessions. The average of the evaluations of the TPs accounts for 4 points out of 20 in the final score of the exam. In the event of an unjustified absence from just ONE practical session, the admissions jury may have to prohibit the student from taking the theory exam. In the event of admission to take the EU exam following an unjustified absence from a lab, a penalty (withdrawal of 4 points) will be applied to the final mark of the theoretical exam. Oral exam if not too many students, MCQ if there are too many students.
Teaching methods	Part ex-cathedra, part flipped classroom.
Content	**The aims of this general biology course are:** 1° to provide basic training on certain aspects of the various components of biology, making it possible to raise awareness very early on of the problems of “big data”. 2° to give a quick and broad vision of several techniques and/or technologies present in the life sciences (generating in part large quantities of information without a priori) and aiming to reveal and raise awareness of the needs of biological approaches -computers to process and analyze data and give them biological meaning. **Chapter 1: Biology … a science and the characteristics of living things**

	Chapter 2: The building materials of living matter and the molecules of life: general structure of macromolecules (polymers) and their monomers **Chapter 3: Structure of prokaryotic and eukaryotic cells and viruses.** **Chapter 4: Relationships between eukaryotic cells and microbiota** **Chapter 5: DNA: the genetic material** **Chapter 6: Gene expression: genes and how they work** **Chapter 7: Genomes and Controls of Gene Expression** **Chapter 8: Genetics of Prokaryotes and Viruses** **Chapter 9: Epigenetics, chromatin modifications and regulation of gene expression**
Faculty or entity in charge	SINC

Programmes containing this learning unit (UE)				
Program title	Acronym	Credits	Prerequisite	Learning outcomes
Bachelor in Computer Science	SINC1BA	5		🔍