



[90h+45h exercises] 11 credits

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Language: french
Level: 1st cycle course

Aims

Introductory course to biology. The objectives are to know and understand: - the constants in structure and function of cells that cover the large diversity that can be observed; - the relations between structures and function at the level of cells and whole organisms making use, among others, of notions of physics and chemistry; - the mechanisms of life transmission; - the diversity of living beings and the main evolutionary strategies.

Main themes

The cell, fundamental unit of all living beings, is studied first to initiate the students to the mechanisms that rule the functioning of life and its particularities. On this basis, the course then studies the cellular diversity and the structural and functional diversity of uni- and multicellular organisms constituting the different kingdoms, their position in the evolution and the growing complexity of their organisation. The mechanisms of evolution are also envisioned, as well as the interactions between the living beings and their environment.

Content and teaching methods

A. CELL BIOLOGY AND INTRODUCTION TO PROKARYOTES, PROTISTS AND FUNGI (37.5h of lectures+ 18h of laboratory; 5 credits)

After an introduction on biology and the living beings, the "Cell biology" part begins with a recall of the main chemical components of the cells and an overview of the principal characteristics of a few representative cell types. The integrated study of cell structures and functions takes place in three "itineraries" :1) the cell environment, the membranes, the traffic across membranes, the lysosomes and the digestion in animal cells, the endoplasmic reticulum, the Golgi apparatus and cell secretion, the plant vacuoles; 2) the cytosol and fermentation, the mitochondrion and respiration, the plastids and photosynthesis, the peroxysomes, the cytoskeleton, the ribosomes and protein synthesis; 3) the interphase nucleus and transcription, the cell cycle (cycle, DNA replication, mitosis and cell division), reproduction (Mendel's laws, meiosis, fertilisation, life cycles). The "Introduction on prokaryotes, protists and fungi" section begins with an overview on the birth of life on Earth and the classification systems. It then envisions the characteristics and diversity of living beings belonging to the prokaryotes, protists and fungi.

B. PLANT BIOLOGY (22.5h of lectures + 17h of laboratory; 3 credits)

The plant biology course aims at understanding the important stages in plant morphogenesis and plant functioning. After an overview on plant evolution and diversity, the course concentrates on flowering plants and addresses the following topics : 1) organography; 2) the formation of the seed and germination ; 3) the primary growth (in length) ; 4) the secondary growth (in width) ; 5) mineral nutrition and the circulation of water and mineral and organic solutes ; 6) the structure of the flower and reproduction.

C. ANIMAL BIOLOGY

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

Pre-requisites : thorough knowledge of mother language, rigor, ability to observe, analyse, synthesise, curiosity, imagination, motivation.

Evaluation : theoretical examination, continuous evaluation for certain laboratory works.

Written and other supports : notes written by the teachers, books, overhead transparencies, internet sites, discussion forum. The course utilises the i-Campus platform. A part of the topics is studied by a projects approach.

Staff support : teachers and teaching assistants for the theoretical classes, the laboratory work, the instructorships and the group meetings in project learning.