
COURSE: ANIMAL AND PLANT BIOLOGY

ACADEMIC YEAR: 2019-2020

TYPE OF EDUCATIONAL ACTIVITY: Basic

TEACHER: Vittoria Infantino

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Language: **ITALIAN**

ECTS:
(9 lessons and 1
tutorials/practice)n. of hours: **84 (72 lessons
and 12 tutorials/practice)**Campus: **Potenza**
Dept./School: **Department of
Science**
Program: **Pharmacy (LM-13)**Semester: I
(from **2 March 2019**
to **31 May/ 20 June**
2019)

EDUCATIONAL GOALS AND EXPECTED LEARNING OUTCOMES

The main knowledge provided will be:

- structure and function of prokaryotic and eukaryotic cells
- main mechanisms of the cell genetic transmission
- basic principles of genetics
- the evolution theory, the principle of natural selection, speciation mechanisms
- classification of living organisms: distinguishing characteristics of Domains and Kingdoms

Students will be able to :

- recognize and describe prokaryotic and eukaryotic cell
- describe main mechanisms of the cell genetic transmission
- observe cell and tissue samples by light microscope
 - trace the flow of matter and energy in the cells and in the biosphere

Making judgements:

- Critical analysis and solving of genetics problems
- to recognize the relationship between structure and function at all levels: molecular, cellular organelle, cellular, and organismal

Communication skills:

- to explain the differences between the different kinds of cells, the mechanisms of the cell genetic transmission, the evolution theory, the principle of natural selection
- to describe the classification of living organisms and compare structural adaptations and life cycles

PRE-REQUIREMENTSnothing

SYLLABUS**Unit 1: Cell Biology**

(40 hours Theoretical lessons + 8 hours Laboratory tutorials)

Topics:

Introduction to the biology

Biological molecules. Energy in living organisms

Autotrophic and heterotrophic metabolism. Anaerobic and aerobic metabolism

Cell structure and function. Homeostasis
The origin and evolution of life on earth
Prokaryotes: main characters
Light microscopy, Fluorescence microscopy, Electron microscopy, Flow Cytometry, Cell Culture.
Eukaryote domain. Eukaryote cell. Cellular organization levels.
Differences between animal and plant cell.
Cell membranes – active and passive transport - osmosis
Cytoskeleton
Endoplasmic reticulum. Golgi apparatus, lysosomes, glyoxysomes and peroxisomes, autophagy.
Mitochondria: Structure. Endosymbiotic theory. Cell respiration and energy conversion.
Genome and inheritance. Additional functions.
Nucleus: chromosome structure. Gene. DNA duplication, transcription.
Ribosomes and protein synthesis. Genetic code.
Cell junctions
Extracellular matrix and animal tissues.
Cell signaling
Cell cycle: Mitosis
Apoptosis

Unit 2:

(20hours Theoretical lessons + 3 hours Laboratory tutorials)

Topics: Reproduction mechanisms – genetics - evolution

Asexual and sexual reproduction. Meiosis -gametogenesis -fertilization
Development and cell differentiation.
Mendelian laws. Sex-linked heredity. Non-Mendelian Inheritance Chromosome and genome mutations.
Human aneuploidies.
The history and development of evolutionary theory.

Unit 3: Classification - Plant kingdom biology - Ecology

(12hours Theoretical lessons + 1 hour Laboratory tutorials)

Topics:

Structure and functions of plants
Plant metabolism: photosynthesis, nitrogen uptake and assimilation.
Taxonomy and biological nomenclature. Systems of classification
Kingdoms- Domains: characteristics
Ecology concepts

TEACHING METHODS

Theoretical lessons (72 hours) using PowerPoint presentations and movies - Laboratory tutorials (12 hours)

EVALUATION METHODS

Oral examination,
Report (laboratory activity)

TEXTBOOKS AND ON-LINE EDUCATIONAL MATERIAL

- BIOLOGIA - Campbell Neil A , REECE Jane B., Ed. Pearson
- BIOLOGIA - S.L. Wolfe, P.J. Russell, P.E. Hertz, C. Starr, B. McMillan, Ed. EdiSES

- L'essenziale di Biologia molecolare della cellula - Alberts, B et al. - Ed. Zanichelli
- Genetica Umana - Concetti e applicazioni -R. LEWIS - Ed. Piccin
Slides (<http://www2.unibas.it/infantino/index.php/farmacia/lezioni-di-farmacia>).

INTERACTION WITH STUDENTS

Office hours: Monday and Tuesday 9:00-11:00 am

Please let me know in advance by email (vittoria.infantino@unibas.it) if you plan to come

EXAMINATION SESSIONS (FORECAST)¹

5/02/2020; 4/03/2020; 18/06/2020; 8/07/2020; 16/09/2020; 14/10/2020; 1/12/2020;

¹Indicative only, may be modified: please check department/teacher website for updating

SEMINARS BY EXTERNAL EXPERTS YES X NO

FURTHER INFORMATION

¹Subject to possible changes: check the web site of the Teacher or the Department/School for updates.