



## ANIMAL BIOLOGY

<b>Enrollment year</b>	2020/2021
<b>Academic year</b>	2020/2021
<b>Regulations</b>	DM270
<b>Department</b>	DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES
<b>Course</b>	NATURAL SCIENCES AND TECHNOLOGIES
<b>Curriculum</b>	PERCORSO COMUNE
<b>Year of study</b>	1°
<b>Period</b>	1st semester (28/09/2020 - 23/12/2020)
<b>ECTS</b>	12
<b>Language</b>	Italian

The activity is split

500370 - ANIMAL BIOLOGY - MOD.

500371 - ANIMAL BIOLOGY - MOD.



### ANIMAL BIOLOGY - MOD.

<b>Enrollment year</b>	2020/2021
<b>Academic year</b>	2020/2021
<b>Regulations</b>	DM270
<b>Academic discipline</b>	BIO/06 (COMPARATIVE ANATOMY AND CYTOLOGY)
<b>Department</b>	DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES
<b>Course</b>	NATURAL SCIENCES AND TECHNOLOGIES
<b>Curriculum</b>	PERCORSO COMUNE
<b>Year of study</b>	1°
<b>Period</b>	1st semester (28/09/2020 - 23/12/2020)
<b>ECTS</b>	6
<b>Lesson hours</b>	52 lesson hours
<b>Language</b>	Italian
<b>Activity type</b>	WRITTEN TEST
<b>Teacher</b>	MERICO VALERIA (titolare) - 6 ECTS
<b>Prerequisites</b>	Basic knowledge of cell biology (general characteristics of animal cell organelles) and biochemistry (general characteristics of the structure and transformations of proteins, nucleic acids, carbohydrates and lipids)
<b>Learning outcomes</b>	To stimulate the study of the cell substructures from morphological, functional and molecular prospective with constant recall of the chemical processes involved.
<b>Course contents</b>	Biological macromolecules: proteins, nucleic acids, carbohydrates, lipids. Role of covalent and non-covalent bonds for macromolecule structure. Structure and function of cellular structures: plasma membrane, endomembrane system (rough and smooth endoplasmic reticulum, ribosomes, Golgi apparatus, endocytosis and exocytosis, lysosomes). Anaerobic and aerobic metabolism: glycolysis, mitochondria, peroxisomes. Cytoskeleton and cell motility (microfilaments, microtubules, intermediate filaments). Eukaryotic cell nucleus (nuclear

	envelope, nuclear lamina, nuclear pores, chromatin, nucleolus). Cell reproduction (mitosis, meiosis). Animal tissues
<b>Teaching methods</b>	Lectures carried out through ppt presentations and practical exercises aimed at acquiring basic skills in the use of the optical microscope and the observation of histological and cellular preparations. The PDFs of the slides will be uploaded to kiro ( <a href="https://idcd.unipv.it/kiro3/">https://idcd.unipv.it/kiro3/</a> ) and available to students
<b>Reccomended or required readings</b>	Colombo e Olmo: BIOLOGIA -CELLULA E TESSUTI. EdiErmes
<b>Assessment methods</b>	<p>The exam will be written. The questions include the full program topics and are organized as followed:</p> <ul style="list-style-type: none"> <li>- three true or false questions (maximum score 2 points/each);</li> <li>- three short answer questions (maximum length of answer: 5 lines) and maximum score: 2 points/each;</li> <li>- two open questions (maximum length of answer: 15 lines). Maximum score: 5 points/each;</li> <li>- one open question (maximum length of answer: 30 lines). Maximum score: 10 points/each.</li> </ul> <p>The exam will be passed with a score equal or greater than 18/30. The maximum score is 30/30 cum laude (which will be assigned when the score is greater than 30).</p> <p>The teacher reserves to carry out in itinere tests that are open only to 1st year students (these tests are not mandatory). If they are passed (minimum score 18/30), the topics covered during these tests will no longer be examined in the final test. In this case the final score will be given by the average of the grade achieved in the ongoing tests and the one obtained in the final test.</p>
<b>Further information</b>	none
<b>Sustainable development goals - Agenda 2030</b>	<a href="#">\$lbl_legenda_sviluppo_sostenibile</a>



### ANIMAL BIOLOGY - MOD.

<b>Enrollment year</b>	2020/2021
<b>Academic year</b>	2020/2021
<b>Regulations</b>	DM270
<b>Academic discipline</b>	BIO/05 (ZOOLOGY)
<b>Department</b>	DEPARTMENT OF EARTH AND ENVIRONMENTAL SCIENCES
<b>Course</b>	NATURAL SCIENCES AND TECHNOLOGIES
<b>Curriculum</b>	PERCORSO COMUNE
<b>Year of study</b>	1°
<b>Period</b>	1st semester (28/09/2020 - 23/12/2020)
<b>ECTS</b>	6
<b>Lesson hours</b>	55 lesson hours
<b>Language</b>	Italian
<b>Activity type</b>	WRITTEN TEST
<b>Teacher</b>	PELLITTERI ROSA DANIELE - 6 ECTS
<b>Prerequisites</b>	NONE
<b>Learning outcomes</b>	<p>At the end of the course the student should know: the Biological Theories on the Evolution and its mechanisms. The fundamental structural characteristics of animal organisms. The reproductive modes and development The animal phylogeny, the fundamentals of the Zoological Systematics and nomenclature rules The basic concepts of Zoogeography. The students must understand: The relationship between structure and function in animals. The Importance of Biodiversity, The complexity of interactions within and between species and with the environment. The students should know to apply the knowledge and skills acquired during the course of Evolutionary and General Zoology to the classification of animal organisms and to the analysis of macro- and micro evolutionary phenomena and their mechanisms.</p>

## Course contents

Zoology as part of Biology; Principles of Science. The origin of life and its principles. fundamental property of life; organic structures of living systems; chemical evolution, origin of living systems; Precambrian life; Prokaryotes and eukaryotes; The big tree of life.

Reproduction and sexuality. Modes of asexual (agamic) reproduction, Mitosis. Sexuality in prokaryotes and protists. Mode of sexual (gamic) reproduction in Metazoa: amphigony, hermaphroditism, parthenogenesis, gynogenesis. Evolution of sex and its significance. Meiosis and life cycle, alternation of generations. Male and female gametogenesis, types of gametes, evolution of anisogamy. sex determination. Fertilization and its modalities.

Evolution of animal diversity. Pre-Darwinian evolutionary ideas. The theory of Darwin and Wallace. The modern synthesis and evidence of evolution. Deterministic and stochastic evolutionary forces: natural selection, sexual selection, mutations, genetic drift. Timing and mode of evolution. Convergent and parallel evolution, mosaic evolution, reticulate evolution. Macro- and micro-evolution. Speciation models

Architecture of the animals in relation to the environment. Support, protection and movement. Symmetry. homeostasis

Classification and phylogeny of animals. The kingdoms Animalia and Protista, the features of the main Phyla. Sort of diversity in a natural hierarchy; Linnaeus and the development of the classification.

Traditional evolutionary taxonomy. Phylogenetic systematics or cladistics. Taxonomic categories and zoological nomenclature rules. Species concepts.

Concepts of Zoogeography. Continental drift and zoogeographic regions. historical and recent distribution of animals. Migrations, invasions, introductions. Origin of the Italian Fauna. Endemisms.

## Teaching methods

The course of Animal Biology is divided into two integrated modules: Evolutionary and General Zoology - Cytology and Histology. The course of Evolutionary and General Zoology consists of classroom lectures. Teachers are available for clarification on the topics covered in class in the receiving timetable.



**Reccomended or required  
readings**

Hickman, Roberts, Keen, Eisenhour, Larson, l'Anson. ZOOLOGY. 16th Edition. McGraw-Hill. € 87.



The exam is written and will focus on the topics covered in class in the two forms in which the course is divided. The student must demonstrate that they have reached the educational objectives of the course. The final grade will be the weighted average of the vote in Evolutionary and General Zoology module and that of the Cytology and Histology module.



