

ACADEMIC YEAR 2022/2023

General information	
Academic subject	BIOLOGY
Integrated didactic modules	ZOOLOGY BOTANY
Degree course	<i>Veterinary Medicine – LM42</i>
Academic Year	I
European Credit Transfer and Accumulation System (ECTS)	6
Language	<i>Italian</i>
Academic calendar	<i>1st 7 weeks period</i>
Attendance	<i>Mandatory</i>

Professor/ Lecturer	E-mail address	Telephone nr,
Caterina Longo	caterina.longo@uniba.it	0805443357
Antonella Bottalico	antonella.bottalico@uniba.it	0805442163
Headquarters	<i>Campus of Veterinary Medicine – sp 62 Casamassima km 3 70010 Valenzano</i>	
Virtual headquarters	<i>Microsoft Teams code – Zoology: hqvawes; Botany: uzb05kf</i>	
Tutoring (time and day)	<p><i>Prof. C. Longo: Monday 11:30-13:30 am and 3:00-4:00 pm on TEAMS, exclusively by appointment via email</i></p> <p><i>Prof. A. Bottalico: Tuesdays 9:00-11:00 am and Wednesdays 9:00-11:00 am and 3:00-4:00 pm by appointment (phone or e-mail) at the teacher office (Campus “E. Quagliariello”, Via Orabona, 4 70125 Bari) or on TEAMS</i></p>	

Syllabus	
Learning Objectives	<i>The course aims to provide students with knowledge relating to the fundamental principles of animal and plant biology, zoology and botany necessary for practicing the medical veterinary profession in all relevant sectors.</i>
Course prerequisites	<p><i>There are no specific prerequisites other than those required for the access to the degree course.</i></p> <p><i>Basic knowledge of animal and plant biology, zoology and botany acquired at secondary level studies will facilitate the understanding of many covered topics.</i></p>

<p>Content of the didactic module of: Zoology Professor: Caterina LONGO</p> <p>Frontal teaching CFU: 4</p> <p>Hours: 32</p>	<p><i>The contents of the module are related to the area of Basic Subjects are:</i></p> <p>Introduction <i>Characteristics of living organisms. Division into Kingdoms. Definition of animal. The chemistry of life, the main classes of organic macromolecules.</i></p> <p>Fundamental principles of animal life <i>The animal cell: evolution, organization and functioning. Mitosis and meiosis.</i></p> <p>Reproduction and development <i>Asexual and sexual reproduction. Hermaphroditism and gonochorism, sex determination. Amphigony and parthenogenesis. General features of embryonic development. Levels of animal organization: protostomes and deuterostomes, diblastic and triblastic, symmetry, metamery and body cavity.</i></p> <p>Fundamentals of comparative morphology and physiology <i>The integument. Skeletal systems. The movement. Breathing, circulation. Nutrition and digestion. Nervous system and sense organs.</i></p> <p>Animal diversity <i>Definition of biological diversity: genetic diversity, diversity at the species level, diversity at the community / ecosystem level.</i> <i>The value and function of biodiversity. Threats to animal diversity.</i></p> <p>Taxonomy and structural plans of animals <i>Nomenclature and animal classification. The animal architecture and bauplan.</i></p> <p>Overview of the main animal phyla <i>Protozoa. Generality, characteristics and phylogeny of the main animal phyla: Poriferans, Cnidarians, Mollusks (Gastropods, Bivalves and Cephalopods), Annelids, Arthropods (Chelicerates, Crustaceans, Myriapods, Hexapods), Echinoderms, Chordates (Urochordates, Cephalochordates and Vertebrates: Chondrichthyes, Osteichthyes, Amphibians, Reptiles, Birds, Mammals).</i></p>
<p>Books and bibliography</p>	<p>AT THE STUDENT'S CHOICE:</p> <ul style="list-style-type: none"> • De Bernardi et al. (2012). Zoologia. Parte Generale. (Idelson-Gnocchi Ed.) • Candia et al. (2016). Zoologia. Parte Sistematica. (Idelson-Gnocchi Ed.) <p>OR</p> <ul style="list-style-type: none"> • Hickman et al. (2020). Fondamenti di zoologia. (McGraw-Hill Ed.) • Hickman et al. (2020). Diversità animale. (McGraw-Hill Ed.)
<p>Additional materials</p>	<p>During the course students will be provided with further bibliographical references as well as slides, scientific articles and links to zoological web sites.</p>
<p>Contents of the didactic module of: Botany Professor: Antonella BOTTALICO</p> <p>Frontal teaching CFU: 2</p> <p>Hours: 16</p>	<p><i>The contents provided refer to the Basic Subjects :</i></p> <ul style="list-style-type: none"> ➤ <i>Introduction: the Plant Kingdom and the Archaeplastida; the endosymbiotic theory; the concept of plant organism;</i> ➤ <i>Cytology: the plant cell; plastids; cell wall; vacuole;</i> ➤ <i>Morphological and anatomical structure: primary and secondary meristematic and adult tissues; general organization, functions and specializations of the main plant organs;</i> ➤ <i>Reproduction and development: Spermatophytes; life cycle of Angiosperms; vegetative reproduction; sexual reproduction: the flower, pollination and fertilization, development of the fruit and dissemination; the seed: morphology and anatomy of the seed in Monocotyledons and Dicotyledons; hypogeal and epigeal germination;</i> ➤ <i>Plants of veterinary importance.</i>
<p>Books and bibliography</p>	<p><i>Raven, Johnson, Mason, Losos, Singer. Struttura e funzione nelle piante (Structure and</i></p>

	<i>function of plants). ISBN: 978-88-299-2211-6 (ed. Piccin).</i>
Additional materials	<i>Multimedia presentations used by the teacher during lessons are available as a support.</i>

Work schedule			
Total	Lectures	Hands on (Laboratory, working groups, seminars, field trips)	Out-of-class study hours/ Self-study hours
Hours			
48	48	0	102
ECTS			
6	6	0	/
Teaching strategy			
<i>The course is structured in lectures for which the teachers use multimedia presentations.</i>			
Expected learning outcomes			
Knowledge and understanding on:	<p>At the end of the course the student must have acquired:</p> <ul style="list-style-type: none"> ○ basic knowledge and fundamental principles of animal life starting from the concepts of general zoology (animal cytology; reproductive and developmental biology) up to the description of the main animal phyla (main levels of biodiversity; scientific nomenclature; structural models of the animal phyla; structural, morphological and functional differences of the main animal phyla); ○ knowledge about the biology of plant organisms, with reference to those of veterinary importance. In particular: <ul style="list-style-type: none"> - To understand the cytological, anatomical and functional characteristics of plants and to be able to correlate structure and function - To know the reproductive mechanisms and how to interpret the life cycle - To know the differentiation methods of cells, tissues and organs aimed at performing specialized functions and the evolutionary path that led to current forms 		
Applying knowledge and understanding on:	<p>At the end of the course the student must have acquired:</p> <ul style="list-style-type: none"> ○ basic zoological skills and competences including tools for recognition and classification of the main animal phyla also through morphological analysis of representative models and dichotomous keys; ○ To develop the ability to carry out specific activities aimed at studying the biology of plant organisms, including: <ul style="list-style-type: none"> - the ability to recognize their structural organization and their functional processes in relation to the environment; - to understand the basic elements for the management of natural and non-natural plant resources, with particular reference to plants of veterinary importance. 		
Soft skills	<ul style="list-style-type: none"> ● Making informed judgments and choices <ul style="list-style-type: none"> ○ At the end of the course the student must have acquired autonomy in the identification and interpretation of methodologically adequate paths to describe the distinctive characteristics of animal phyla; ○ To collect and critically interpret scientific data in the zoological and botanical field, describe and compare them; ○ To propose generalizations; ○ To apply the acquired knowledge to a proposed problem. ● Communicating knowledge and understanding <ul style="list-style-type: none"> ○ To present the acquired knowledge with a vocabulary and terminology appropriate to the discipline; ○ To exchange information and interact with other people. 		

	<ul style="list-style-type: none"> • Capacity to continue learning <ul style="list-style-type: none"> ○ To understand and critically discuss important aspects of animal and plant biology; ○ To extend autonomously the acquired knowledge by reading and understanding, specific texts or additional resources with scientific content; ○ To use the newest topics of scientific papers related to the field of interest.
Assessment and feedback	
Methods of assessment	<p>The assessment of each student is based on an oral examination. The Biology exam includes the simultaneous evaluation of both modules of Zoology and Botany. If one of the two modules is not passed, it is granted the possibility to complete the missing module within the first subsequent examination session, under penalty of invalidation of the already passed module. Participation in lectures and classroom discussions during the course will also be taken into account. The exam consists of: 1) presentation of animal taxa and related zoological insights; 2) presentation of a plant of veterinary importance with its botanical aspects; 2) a series of three to four questions that require the discussion of a topic, linked with other ones, in order to evaluate the acquired knowledge, reasoning and communication skills, the ability to solve practical problems. Overall, communication skills, the ability to link different topics and to synthesize are evaluated.</p>
Evaluation criteria	<ul style="list-style-type: none"> • <i>Knowledge and understanding</i> <ul style="list-style-type: none"> ○ To know appropriately, correctly and congruently the topics of the course with particular regard to cytological, histological, morphological/functional, ecological and environmental aspects; ○ The student is called to apply the theoretical aspects acquired for the recognition, classification and description of the animal phyla also by means of comparative morphological analyzes of representative models. • <i>Applying knowledge and understanding</i> <ul style="list-style-type: none"> ○ The student must be able to apply the theoretical knowledge acquired by demonstrating the ability to recognize the main animal taxa studied during the course; ○ To talk about a plant of veterinary importance, evaluating the cytological, histological, anatomical characteristics, relating them to the environment. • <i>Autonomy of judgment</i> <ul style="list-style-type: none"> ○ The student must be able to independently analyze the knowledge and skills acquired by demonstrating his ability to identify the morphological and structural characteristics necessary for the identification and taxonomic classification of the studied animal phyla; ○ To create logical connections in the exposition and consequentiality in the connection of contents; ○ To establish a coherent general discourse with appropriate links with a multidisciplinary connotation. • <i>Communication skills</i> <ul style="list-style-type: none"> ○ To appropriately use a specific language and the synthesis ability, also through the graphic expression of notions and concepts (e.g. schemes and drawings) • <i>Capacity to continue learning</i> <ul style="list-style-type: none"> ○ To discuss problems in a constructive manner and to solve situations related to plants, demonstrating an in-depth analysis of the issues carried out autonomously by consulting specific scientific publications and databases.
Criteria for assessment and attribution of the final mark	<p><i>The final mark of the Biology exam is expressed out of 30 obtained from the collegial evaluation of the two modules of Zoology and Botany. The exam is passed when the</i></p>



	<p><i>grade is greater than or equal to 18. The mere notional knowledge of terms and concepts is not sufficient for passing the exam. Knowledge and understanding, even applied, are essential for passing the exam. The development of transversal skills related to autonomy of judgment, communication skills and capacities to continue learning allows the student to achieve a high evaluation. To students with a strongly positive evaluation in both modules of Zoology and Botany, the Examination Commission may decide, unanimously, to award honours at the final mark of Biology (30 cum laude).</i></p>
Additional information	