

ACADEMIC YEAR 2022/2023

General information	
Integrated course	ANATOMY 1
Integrated academic modules	Histology and Embryology Anatomy of Domestic Animals 1
Degree course	Veterinary Medicine
Anno di corso	I
European Credit Transfer and Accumulation System (ECTS):	8 (ECTS lessons: 6; ECTS exe/lab/tutor: 2)
Language	Italian
Academic calendar (starting and ending date)	III two months period
Attendance	Mandatory

Professor	E-mail	Telephone
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Department and address	Campus of Veterinary Medicine, S.P. per Casamassima km 3, 70010 Valenzano (Ba), Italy
Virtual headquarters	Teams platform
Tutoring (time and day)	Prof. Salvatore. Desantis: Monday -Thursday- Friday; 15:30-17:30 Prof, Tiziana Martinello: Tuesday 9:00-11:00, Wednesday 14:30-16:30

Syllabus	
Learning Objectives	<p>The educational objectives of the integrated course “Anatomy 1” constituted by the modules “Histology and Embryology” and “Anatomy of Domestic Animals 1” provide students with knowledge of cellular structures, histological structures, embryonic development, and the structural composition of the musculoskeletal system.</p> <p>The aim of the course is to provide the student with knowledge concerning: the eukaryotic cell structure and the functions of cell organelles; the organization and functions of tissues; the basic mechanisms of embryonic development; the formation, structure, and function of the embryonic adnexa of mammals of veterinary interest; the morphological and structural knowledge of the locomotor and integumentary apparatus of domestic animals with special regard to identification and knowledge of the main features of bone structures (cranium, trunk, and limbs), location and knowledge of insertions, origin and actions of the main muscles of each region, knowledge of the main skin adnexa.</p> <p>The student at the end of the course should be able to recognize the histological tissues under the light microscope and have information on systematic and comparative anatomy necessary for better learning of clinical and zootechnical disciplines.</p>
Course prerequisites	The student should possess good knowledge of basic cell biology. Ability to organize the study with completeness and synthesis.



<p>Contents of: HISTOLOGY AND EMBRYOLOGY</p> <p>Teacher: Salvatore Desantis</p> <p>CFU:4</p> <p>Lectures: 30</p> <p>Practical activities and exercises</p> <p>Professor: Salvatore Desantis</p> <p>ECTS: 1 Hours: 15</p>	<p>The course refers to Basic Sciences</p> <ul style="list-style-type: none">• Histology.<ul style="list-style-type: none">➤ Structure and organization of the eukaryotic cell: cell membrane, cytosol, cytoplasmic membrane system (endoplasmic reticulum, Golgi apparatus, lysosomes, vesicles), mitochondria, peroxisomes, cytoskeleton, centriole, vibratile cilia, flagellum; exocytosis, endocytosis, nucleus (nuclear envelope, chromatin, chromosomes, nucleolus).➤ Cell cycle. Cell differentiation and histogenesis.➤ Epithelial tissue: simple epithelium (squamous, cuboidal, columnar, pseudostratified); stratified epithelium (squamous keratinized and non-keratinized, cuboidal, columnar, urothelium). Glands: exocrine and endocrine glands.➤ Connective tissue: ground substance (glycosaminoglycans, proteoglycans, glycoproteins), fibers (collagen, reticular, elastic); cell types; basement membrane. Types of connective tissue: loose (areolar), dense, reticular, elastic, mucoid, pigmented, adipose tissues.➤ Cartilage: hyaline cartilage, elastic cartilage, fibrocartilage.➤ Bone tissue: nonlamellar (primary), compact and cancellous bone tissue.➤ Blood: plasma, erythrocytes, leucocytes (neutrophils, eosinophils, basophils, lymphocytes, monocytes), platelets.➤ Muscle tissue: striated muscle (skeletal and cardiac muscle), smooth muscle.➤ Nerve tissue: neurons, glial cells, myelin sheath, nerve fiber, synapses, peripheral nerve.• Embryology.<ul style="list-style-type: none">➤ Gametes.➤ Fertilization, cleavage, blastocyst.➤ Gastrulation: formation of ectoderm, mesoderm, endoderm and their derivatives; neurulation.➤ Implantation of the blastocyst.➤ Fetal membranes: amnion, chorion, yolk sac, allantois, umbilical cord.➤ Placentation. Types of the placenta. <p>Practice</p> <ul style="list-style-type: none">• Techniques for cell and tissue investigation at light microscopy: collection, fixation, dehydration, embedding, microtomy. Hematoxylin-eosin staining.• Light microscope: components and use. Recognition of cytological structures in histological section stained with hematoxylin-eosin and with trichrome stainings.• Identification at light microscope of tissues and their structures in histological slide stained with hematoxylin-eosin, trichrome and the most common histochemical methods.• Observation at light microscope of histological sections of embryos at different stages of development. <p>Macroscopic analysis of fetuses and placentas of domestic mammals</p>
<p>Contents of: ANATOMY OF DOMESTIC ANIMALS 1</p> <p>Teacher: Tiziana Martinello</p>	<p>The course refers to Basic Sciences</p> <ul style="list-style-type: none">• Introduction: Anatomical terminology; generalities about bones (architecture and classification), generalities about joints (classification of different types of joints and description of their components; joint movements); generalities about muscles (architecture and classification) and their attachments (tendons, muscle fascias, bursae and synovial sheaths). Division of the body into regions.

<p>CFU: 4</p> <p>Lectures: 30</p> <p>Practical activities and exercises</p> <p>Teacher: Tiziana Martinello</p> <p>ECTS: 1 Hours: 15</p>	<ul style="list-style-type: none">● Osteology and Arthrology<ul style="list-style-type: none">➤ HEAD: bones of the neurocranium and splanchnocranium; joints of the head.➤ TRUNK: spinal column (cervical, thoracic, lumbar, sacral, coccygeal vertebrae), spinal joints, ribs, sternum, joints of the thorax.➤ THORACIC LIMB: scapula, humerus, radius, ulna, carpus, metacarpus, phalanges. Joints: scapulohumeral, elbow, antibrachial, carpal, interphalangeal.➤ PELVIC LIMB: bones of coxal, femur, patella, tibia, fibula, tarsus, metatarsus, phalang. Joints of the pelvis, coxo-femoral, patellofemoral, leg, tarsal, foot.● Myology.<ul style="list-style-type: none">➤ HEAD: major muscles.➤ TRUNK: muscles of the neck, thorax, abdomen, tail.➤ THORACIC LIMB: muscles of the shoulder, arm, forearm, muscles and fascial system of the hand.➤ PELVIC LIMB: muscles of the pelvis, thigh, leg, muscles and fascial system of the foot.● Integumentary system: skin, skin adnexa, corneal productions, mammary gland, hoof. <p>Practice Practical activities consist in the study of skeletal preparations, anatomical models, and guided sessions of joint and muscle dissections.</p>
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Organization of practical activities	<p>The practical activities are organized in the afternoon hours during the teaching period according to the schedule given in the class diary.</p> <p>Students will be divided into groups and the activities will be replicated for each group. The number of groups and the number of students per group will depend on the type of practical activity and the capacity of the practice room.</p>
Biosecurity standards for the practical activities	<p>Access to laboratories is allowed only to students equipped with protective clothing (gowns and disposable latex gloves), who have reviewed the biosafety manual and signed the risk exposure consent form.</p>

Personal study books and bibliografy	
Books and bibliography	<p>Histology and Embryology: Dalle Donne I: Citologia e Istologia. EdiSES Napoli, 2019. Junqueira: Istologia. Ed. Piccin, Padova, 2020. Monesi V: Istologia. 7a Edizione- Ed. Piccin, Padova, 2018. Bacha WJ, Wood LM: Atlante a colori di Istologia Veterinaria. Antonio Delfino Editore, 2003. Pelagalli, Castaldo, Lucini, Patruno, Scocco: Embriologia. Morfogenesi e anomalie dello sviluppo. III Edizione. Idelson-Gnocchi, Napoli, 2009.</p> <p>Anatomy of Domestic Animals 1:</p>

	Konig H.E., Liebich H.G., Atlante dei mammiferi domestici. Vol. 1 Apparato locomotore. Piccin Nuova Libreria. Barone R., Anatomia comparata dei mammiferi domestici, Vol. 1, 2 (Osteologia, Artrologia, Miologia), Edagricole, Bologna.
Additional materials	Additional teaching materials are provided by professors during the course, available on the teaching TEAMS platform

Organizzazione della didattica			
Ore			
Totali	Didattica frontale	Pratica (laboratorio, campo, esercitazione, altro)	Studio individuale
200	60	30	110
CFU/ETCS			
8	6	2	

Teaching strategy	<p>The main teaching methods adopted in the integrated course consist in face-to-face classroom lectures (Lectures) and group practical classes, with self-study activities through the use of audiovisuals and movies available to students on the TEAMS platform and self-assessment tests provided by the lecturers. Audiovisuals and movies will be available for students to support and stimulate hands-on activities (learning by doing).</p> <p>During the Anatomy of domestic animal 1 module, seminars with outside veterinarians will be organized to highlight clinical applications of the veterinary basic science. The face-to-face lectures will be supported by teaching materials provided before the lectures so that the student becomes an "active" student during the classroom lectures in which the lecturer becomes the director of the learning process (flipped classroom). During practical activities, through the organization of small working groups, collaborative study will be implemented to consolidate individually learned knowledge and stimulate active learning. The objectives of the groups will be well defined through worksheets to be completed that will also allow for self-assessment. The presence of the lecturer will be essential as a guide in carrying out the activity and as support for groups that need it.</p>

Expected learning outcomes	
Knowledge and understanding on:	<ul style="list-style-type: none"> • Skills in the logical approach to scientific reasoning (DOC 2.1) • Research methods, contribution of basic and applied research to veterinary science (DOC 2.2) • The principles of effective interpersonal interaction, including communication, management and team working (DOC 2.11).
Applied knowledge and understanding on:	<ul style="list-style-type: none"> • Be able to critically review and evaluate literature and presentations (DOC 1.8) • Take part in peer group self-review and review processes to improve performance (DOC 1.14)
Soft skills	<p>Autonomy of judgment</p> <ul style="list-style-type: none"> • Be able, with full autonomy, to indicate the most appropriate histological and anatomical approach for the study of different structures of animal species, demonstrating competence in logical approaches to scientific reasoning (DOC 2.1) <p>Communication skills</p>

	<ul style="list-style-type: none"> • Be able to communicate, using correct scientific terminology (DOC 1.4) • Work effectively in groups, using appropriate communication and interaction strategies (DOC 1.6) <p>Ability to learn independently</p> <ul style="list-style-type: none"> • Be able to critically review and evaluate literature and presentations (DOC 1.8) • Ability to independently learn and investigate topics of professional interest while maintaining lifelong learning (DOC 1.13)
Summary of the acquired knowledge and skills (Day One Competence) as provided by the EAEVE	<p>Knowledge:</p> <p>2.1 2.2 2.11 1.8 1.14</p> <p>Skills:</p> <p>2.1 1.4 1.6 1.8 1.13</p>

Assessment and feedback	
Methods of assessment	<p>The exam of the integrated course of "Anatomy 1" allows the acquisition of 8 CFUs stipulated in the study plan.</p> <p>The exam consists in the oral examination of the module of "Histology and Embryology". After passing this exam, the student will be allowed to take the oral exam of "Anatomy of Domestic Animals 1." The examination of the two modules can be taken in the same session or in different sessions. The CFUs are considered acquired after passing the two parts and recording the minutes on the ESSE3 portal.</p>
Evaluation criteria	<ul style="list-style-type: none"> • <i>Knowledge and understanding:</i> <ul style="list-style-type: none"> ○ The student must demonstrate organic knowledge of cytology, histology, basic principles of embryology, and osteo-myology of the major mammals of veterinary interest. <p>Score from 1 to 8</p> <ul style="list-style-type: none"> • <i>Applying knowledge and understanding:</i> <ul style="list-style-type: none"> ○ The student should demonstrate good ability to apply acquired knowledge to the recognition of histological structures and localization of components of the skeletal and muscular systems. <p>Score from 1 to 8</p> <ul style="list-style-type: none"> • <i>Autonomy of judgment:</i> <ul style="list-style-type: none"> ○ The student must demonstrate ability to identify the best approach to the recognition, individuation and description of the proposed structures. <p>Score from 1 to 8</p> <ul style="list-style-type: none"> • <i>Communication skills:</i> <ul style="list-style-type: none"> ○ The student must demonstrate good expository skills in the topics studied and be able to use technical and scientific terminology appropriately. <p>Score from 1 to 3</p>



	<ul style="list-style-type: none">• <i>Ability to learn:</i><ul style="list-style-type: none">○ The student must demonstrate ability to independently rework the knowledge acquired and be able to access scientific literature and databases for continuous updating. <p>Score from 1 to 3</p>
Criteria for assessment and attribution of the final mark	<p>The outcomes of the "Histology and Embryology" and "Anatomy of Domestic Animals 1" tests will contribute to the final grade of the Anatomy 1 exam. The final grade is the result of the collegial judgment related to the two modules in which the student must demonstrate that he/she has acquired a critical sense of the topics studied. The exam, expressed in thirtieths, will be considered passed with a grade equal to or greater than 18. The mark will take into consideration not only the accuracy of the answer, but also the ability to communicate, clarity of exposition, disciplinary competence, and the level of in-depth study.</p>
Additional information	<ul style="list-style-type: none">•