

## 28405 - Embryology and Anatomy I

### Información del Plan Docente

<b>Academic Year</b>	2018/19
<b>Subject</b>	28405 - Embryology and Anatomy I
<b>Faculty / School</b>	105 - Facultad de Veterinaria
<b>Degree</b>	451 - Degree in Veterinary Science
<b>ECTS</b>	7.0
<b>Year</b>	1
<b>Semester</b>	First semester
<b>Subject Type</b>	Basic Education

### Module

#### 1.General information

##### 1.1.Aims of the course

##### 1.2.Context and importance of this course in the degree

##### 1.3.Recommendations to take this course

#### 2.Learning goals

##### 2.1.Competences

##### 2.2.Learning goals

##### 2.3.Importance of learning goals

#### 3.Assessment (1st and 2nd call)

##### 3.1.Assessment tasks (description of tasks, marking system and assessment criteria)

#### 4.Methodology, learning tasks, syllabus and resources

##### 4.1.Methodological overview

The teaching methodology is structured in three levels: theoretical classes where student participation is encouraged; also lab sessions and practical works/tasks development based on lab sessions are proposed.

##### 4.2.Learning tasks

There will be the following activities:

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5.2.1. Theoretical classes (50%): 35 hours. The main course contents are presented.

5.2.2. Practical classes with the active involvement of the student (31.5 hours). Different lab sessions are carried out.

Notes for each lab session where the different activities are planned will be available before the session

5.2.3. Tutored Work Practices Preparation (5 %): 3.5 hours including instruction issue specific dissecting awarded, performing / exhibition with colleagues

5.2.4. Virtual Course Information Management in the Degree of Veterinary Medicine.

5.2.5. Tutorship. Students may solve any questions they might have about unclear contents of the course

5.2.6. Evaluation: Set of theoretical and practical work and delivery of written works.

### 4.3.Syllabus

Theoretical classes

Session

TITLE

Introduction. Concept, Purpose and content of the Veterinary Anatomy.  
Division of Anatomy Study Techniques.  
Organs and systems.

1

General Embriology. Concept, purpose and content of the Veterinary Embryology.  
Stages of prenatal development: germinal, embryonic and foetal periods

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- 2 Gametogenesis. General concepts.  
Spermatogenesis: phases, Multiplication, maturation, transformation and release of sperm. Comparative morphology of sperm and abnormal forms. Oogenesis: phases. Types of eggs. Egg birds
- 3 Fertilization. Main events and consequences of fertilization. Polyspermy. Parthenogenesis. Fertilization in birds. Segmentation, morulation and blastulation in mammals and birds. Hatching of the blastocyst
- 4 Gastrulation in mammals and birds. Embryonic or organogenetic period. Derivatives of the germ layers: ectoblast, mesoblast and endoblast. Neurulation and training of sketches or primary organs. Appearance of body shape
- 5 Introduction to the development and establishment of the Central and Peripheral Nervous Systems
- 6 Cardiovascular system. Development of heart and vascular system. Description of the fetal circulation and changes that occur at birth. Congenital malformations
- 7 Splanchnology. General concepts. Anterior, middle and posterior intestine. Derivatives of the pharynx: pharyngeal pouches. Gill slits
- 8 Visceral arches. Language development and thyroid gland. Development and training of the lungs and pleura. Congenital

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malformations

9 Respiratory System. Development of the skull and face. Palate development and training of oral and nasal cavities. Congenital malformations

10 Concepts and mechanisms of development: differentiation, growth, cell migration, morphogenic movements, cellular adhesiveness and affinity. Cell death.

11 Control and genetic regulation of embryonic development. Transgenesis. *In vitro* fertilization. Embryo transfer. Handling blastocyst. Cloning

12 Nidation or implantation. Embryonic appendages: yolk sac, amnion, allantois and chorion. Embryonic and extraembryonic circulation

13 Placentation. Anatomical and histological classification of placentas. Umbilical cord and chorionic sac. Evolution and characteristics of the chorionic sac in the different domestic species

14 Locomotor System. Definition and parts. Phylogeny and ontogeny. Osteology: osteogenesis and their types. Bone structural organization. Bone biomechanics.

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- 15 Arthrology: artrogénesis. Types of joints and elements that constitute them. Ligaments. Joint biomechanics.
- 16 Miology: myogenesis. Muscles: types and classification. Structural organization of striated skeletal muscle. Auxiliary locomotor structures
- 17 Axil region. Embryonic development. Deformities and congenital anomalies. Regionalization and vertebral formula. Joints of the spine. Biomechanics and joint study: comparative anatomy.
- 18 Autochthonous muscles of the spine: classification. Muscles of the medial and lateral tracts: a comparative study. Tail muscles. Ventral neck muscles: classification and comparative study. Neck fascias
- 19 Thorax: comparative study. Joints and muscles: classification and biomechanics. Diaphragm muscle: development, description and comparative study
- 20 Abdominal muscles: development and classification. Linea alba, prepubic tendon and inguinal ligament. Inguinal canal. Comparative study.
- 21 Composition of a spinal nerve. Regional differences between the spinal nerves. Sensory and motor innervation of the neck, trunk and tail.
- 22 Vascularization of the neck, trunk and tail. Large vessels: aorta, vena cava and

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parietal branches. Azygos vein and its branches. Lymphatic system ontogeny. Lymph nodes and lymphatic vessels of the axial region: thoracic duct and chyle cistern

23

Forelimb. Phylogeny and ontogeny of members: congenital anomalies

24

Scapular fixator muscles: classification. Situation, relationships and movements of the scapula. Shoulder joint: articular surfaces, ligaments and movements. Motor muscles of the humerus: classification and comparative study

25

Elbow joint: articular surfaces, ligaments and movements. Elbow motor muscles: functional classification and comparative study. Carpal joints and phalanges: comparative study of the articular surfaces, ligaments and movements

26

Forearm muscles: functional classification and comparative study. Hand muscles: functional classification and comparative study

27

Innervation of the forelimb: comparative study of the brachial plexus and its collateral and terminal branches

28

Arterial, venous and lymphatic vascularization of the thoracic limb: a comparative study. Fascias and forelimb subcutaneous synovial comparative study

29

Elastic and corneal structures of the extremities. Fingernail, ungula and ungulates. The hoof of ruminants and swine. The hoof of equines: morphology

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and functional organization

- 30 Hindlimb. General concepts. Pelvic girdle: a comparative study. Hip joint: articular surfaces ligaments and movements. Femur skeletal muscles: classification
- 31 Femur motor muscles: Comparative study
- 32 Knee and proximal tibiofibular joints: articular surfaces, ligaments and movements. Motor muscles of the knee joint: classification and comparative study
- 33 Comparative study of foot joints: articular surfaces, ligaments and movements. Leg and foot muscles
- 34 Innervation of the hindlimb: comparative study of the lumbosacral plexus and its collateral and terminal branches
- 35 Arterial, venous and lymphatic vascularization of the hindlimb: comparative study.
- Fascias and synovial of the hindlimb: comparative study&shy;

Practical classes

PRACTICA NUMBER

TITLE

## 28405 - Embryology and Anatomy I

- 1 Anatomical planes. Nomenclature. Types of bones and basic structure. Spine vertebra type. Vertebral formula
- 2 Cervical vertebrae: a comparative study. Nuchal skull face. Hyoid. Radiographs of the neck
- 3 Thoracic vertebrae. Ribs and sternum. Lumbar, sacrum and caudal vertebrae. Introduction to the pelvis. Radiographs of the chest, abdomen and pelvis
- 4 Scapula and humerus. Comparative study. Radiographs of back and arm
- 5 Radius, Ulna, Carpus and Metacarpus. Radiographic study
- 6 Phalanges. Hoof and hoofs. Anatomical and Radiographic study
- 7 Innominate bone, femur and patella. Recognition of details and lateral radiographs
- 8 Tibia, fibula and tarsus. Recognition of details and radiographs
- 9 Surface Anatomy and Body Regions. Skin lifting of the neck, back, arm, thorax and abdomen region. Recognition of surface structures: superficial fascia.



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- 10 Dissection of the lateral aspect of the neck: superficial, medium and deep planes.
- 11 Dissection of the ventral aspect of the neck: superficial and deep planes. Visceral cavity of the neck: limits, content and deep fascia of the neck.
- 12 Lateral planes of the thorax and abdomen I (disinsertion of the latissimus dorsi and trapezius). Epiaxial muscles of the spine. Intercostal muscles
- 13 Lateral planes of the thorax and abdomen II (disinsertion of the external and internal oblique muscles of the abdomen). Surface plane of the back and arm. Superficial dissection of pectoral muscles
- 14 Dissection of the lateral aspect of back, shoulder and arm. Pectoral muscles
- 15 Dissection of the armpit: arm brachial plexus and arterial and venous branches
- 16 Dissection of the dorsal aspect of the forearm and hand
- 17 Dissection of the caudal aspect of the forearm and hand
- 18 Dissection of the rump and hip. Recognition of the important details for surgery in the region
- 19 Dissection of the lateral and medial thigh. Recognition of the important details for surgery in the region

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20 Dissection of the knee and lateral leg.  
Recognition of the important details for  
surgery in the region

21 Dissection of the caudal aspect of the leg  
and foot. Recognition of the important  
details for surgery in the region

### 4.4.Course planning and calendar

The course calendar is defined by the Veterinary faculty calendar.

### 4.5.Bibliography and recommended resources