



Universitat de Lleida

# DEGREE CURRICULUM **ANIMAL ANATOMY I**

Coordination: GARCIA ISPIERTO, IRINA

Academic year 2019-20

## Subject's general information

<b>Subject name</b>	ANIMAL ANATOMY I			
<b>Code</b>	100302			
<b>Semester</b>	1st Q(SEMESTER) CONTINUED EVALUATION			
<b>Typology</b>	<b>Degree</b>	<b>Course</b>	<b>Character</b>	<b>Modality</b>
	Double bachelor's degree: Bachelor's Degree in Veterinary Medicine and Bachelor's Degree in Science and Production	1	COMMON	Attendance- based
<b>Course number of credits (ECTS)</b>	6			
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	PRALAB	PRAULA	TEORIA
	<b>Number of credits</b>	1.6	1	3.4
	<b>Number of groups</b>	5	4	1
<b>Coordination</b>	GARCIA ISPIERTO, IRINA			
<b>Department</b>	ANIMAL HUSBANDRY			
<b>Teaching load distribution between lectures and independent student work</b>	Hores presencials: 60 Hores no presencials: 90			
<b>Language</b>	Català: 50% Castellà: 12,5% English: 36,5%			

## Teaching staff

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
GARCIA ISPIERTO, IRINA	irinag@ca.udl.cat	3,2	
GARCIA JIMENEZ, RUTH	ruth.gj@ca.udl.cat	1	
MARTIN ALONSO, MARIA JOSE	maralomj@ca.udl.cat	6	
PELEGRIN VALLS, JONATHAN	jonathan.pelegrin@udl.cat	,8	
SERRANO PÉREZ, BEATRIZ	bserrano@ca.udl.cat	4,4	

## Subject's extra information

Some outdoor practices are included.

## Learning objectives

### Knowledge objectives

Know and understand the embryonic development of the systems, in order to be able to understand the origin of certain congenital anomalies. Know the postnatal changes of the systems, as well as their topography in the adult animal. Understand the relationships of the organs in the thoracic, abdominal and pelvic cavity. Tissue histology. Comparative general osteology

### Capacity objectives

The student who passes the subject must be able to use the knowledge previously indicated in the study of other related subjects. He will know how to use the anatomical and histological terminology correctly and will know how to access and use autonomously embryological and anatomical information sources. He will begin to master different histological and laboratory techniques, as well as dissection techniques. He/she will recognize the bones and their parts of the main domestic animals

## Significant competences

### Strategic competences of the University of Lleida

foreign language

Respect and development of Human Rights, democratic principles, the principles of equality between women and men, and the values of a culture of peace and other democratic values.

### **Transversal competences of the degree**

Interpret studies, reports, data and analyze them numerically.

Work alone and in a multidisciplinary team.

Understand and express yourself with the proper terminology.

Discuss and argue in various debates.

Analyze and assess the social and ethical implications of professional activity.

Have a critical and innovative spirit.

### **Veterinary specific competences**

Know the structure and function of healthy animals and the relationship between them

Being able to recognize the different tissues, organs, devices and systems of the animals

Apply knowledge of animal anatomy in the development of professional activity

Understand embryology to apply it to the understanding of the complex morphology of the adult animal

Topography in different domestic animals

General histology

Comparative Osteology

## **Subject contents**

### **Theory**

General embryology, histology and topography of organs.

Themes:

1. Animal body: its parts and regions. Definition of organs and systems. Anatomical position. Anatomical terminology

General Embryology:

2. Meaning of embryology: Ontogeny development: definition and periods

3.- Spermatozoa structure

4.- Oocyte structure. Types of oocytes. Birds oocytes.

5.- Fecundation. Capacitation of spermatozoa. Mechanisms of approximation to oocyte. Activation of the oocyte. Parthenogenesis. polyspermy.

6.- Germinal period. Segmentation. Morula. Blastocyst. Hatching

7.- Gastrulation. Mechanisms of formation of the 3 germinative layers

8.- Embryonic or organogenetic period. Differentiation of the germinative layers: neurulation and formation of the primary organs.

9.- Biological processes that take place during ontogenetic development: Cell determination and differentiation, growth, cell migration and morphogenetic movements, adhesion and cellular affinity, apoptosis.

10.- Control and regulation of ontogenetic development: development in mosaic and by regulation, potential and prospective significance, embryonic induction and competence, positional information and morphogenetic gradients.

11.- Embryonic nidation. Extraembryonic attachments: Amnios, allantois, yolk sack and chorion. Comparative anatomy.

12- Placentation. Anatomical and histological classification of placentas. Biology of the placenta: Placental barrier, placental circulation, placental secretion and deciding.

14.- Fetal period. Fetal growth Stages of fetal development and estimation of age in the main domestic mammals (0.5 h)

### Histology

16. Basis of histology: Concept of histology. Basic tissues. Histofisiology. Histological techniques of cells and tissues

17. Epithelial and conjunctive tissue

18. Cartilaginous and bone tissue

19. Muscle tissue

20. Nervous tissue

### Block 3. Topography and general orthogenesis of organs

#### Part 1. Ontogeny

21. Ontogeny of the heart. Postnatal changes

22. Development of the intraembryonic circulatory system. Arterial and venous systems: aortic arches, dorsal aortas, cardinal, supracardinal and subcardinal veins. Circulatory changes at birth. Congenital anomalies

23. Primitive bowel. Development and parts: Intestines anterior, middle and posterior. Celoma and derived cavities. Derivatives of the cranial portion of the anterior intestine: pharyngeal pouches. Congenital anomalies

24. Development of the caudal portion of the anterior intestine: tracheobronchial outline. (1 hour)

25. Branchial arches. Development of the thyroid gland Facial development Oral and nasal cavities, palate and choanas. Congenital anomalies

26. Derivatives of the middle and posterior intestines. Congenital abnormalities of the intestine. Small intestine: duodenum, jejunum and ileum.

27. Development of the urinary system: pronephros, mesonephros and metanephros; urinary tract. Congenital malformations.

28. Development of the gonads and genital ducts. Undifferentiated period and evolution in the male and female. Congenital malformations.

29. Development of the external genitalia of the male and female. Testicular descent mechanics

30. Embryology of the mammary gland. Comparative anatomy. Congenital malformations

31. Morphogenesis of the spinal cord. Metamerism Growth of the spinal cord and the vertebral canal. Congenital malformations.

32. Morphogenesis of the encephalon: stages of three and five vesicles. Development of the diencephalon and telencephalon, mesencephalon and rhombencephalon. Congenital malformations

Part 2. Postnatal changes and topography in the adult animal

33. Cambios postnatales de los aparatos y sistemas.

## Osteology

1. Introduction: ossification, bone types

2. Axial skeleton

3. Thoracic member

4. Pelvic member

## Practices

### Histology block

Muscle tissue

Connective and epithelial tissue

Nervous tissue

Cartilaginous and bony tissue under the microscope

### Embryology block (dissection room / classroom)

Morphology of the male reproductive system . Study of the route of sperm during spermatogenesis. Testicles Tunics, external morphology and study of structures in longitudinal sections. Spermatic cord Accessory glands Penis and foreskin. Parts and external morphology. Comparative anatomy.

Morphology of the female reproductive system . Study of the place of fertilization and structure of the ovary. Ligaments and ovarian pouch. Identification of structures in longitudinal sections of the ovary. Uterine thrombus. Horns, body and neck of the uterus. Wide ligament. Vagina, vestibule, vulva and clitoris. Study of structures in longitudinal sections of the genital tract. Comparative anatomy

Self-assessment seminar

## Osteology Block (Dissection room)

Scapula

Humerus, ulna, radius

carpus and phalanges

Ribs, vertebrae, sacrum

Hip and femur

Tibia, fibula, tarsus and helmet

## Methodology

The lessons will be realized in one day per week (3-5 hours/day). Several documentation such as power points or links will be accessible for the students in campus virtual. Active learning will be promoted by the realization of poster, flipped learning and case method. After each practical session, an exam will be realized by the student. All practical session will be performed in groups of 15 students in the dissection room or in the histology lab.

## Evaluation

10% Small examans after each practical session

5% Exam after GREFACSA

8% Poster

20% Oral exam

Cumulative exams

14% Histology

18% General embriology

25% All course

## Bibliography

- Bacha W, Wood L. Atlas color de histología veterinaria. Ed. Inter-medica. 1991
- Banks WJ. Histología veterinaria aplicada. Mexico: Ed El Manual Moderno 1986.
- Clayton HM, Flood PF. Large animal applied anatomy. Mosby-wolfe. 1996
- CLIMENT, S. y J.A. BASCUAS (1989): Cuadernos de Anatomía y Embriología Veterinaria. (1, 2, 3, 4, 5 y 6). Ed. Marbán, Madrid.
- DYCE, K.M., W.O. SACK y C.J.G. WENSING (1999): Anatomía veterinaria. Ed. McGrawHill Interamericana.
- GIL CANO, F y cols. (1998) Osteología Veterinaria. Diego Marin, Murcia.
- GILBERT, SF (2005) Biología del desarrollo (7ª ed) Ed. Médica Panamericana
- Frandson RD. Anatomía y fisiología de los animales domésticos. 3ª Ed. Mexico: Ed Interamericana 1984.
- NICKEL, R., A. SCHUMMER y E. SEIFERLE (1986): The Anatomy of the Domestic Mammals. Vol. 1: The locomotor system of the domestic animals. Paul Parey, Berlin.
- Kolb E. Fisiología veterinaria. Zaragoza: Ed Acribia 1971.

- KÖNIG HE, LIEBICH HG (2004): Anatomía de los animales domésticos-Tomo1: Aparato Locomotor. Ed. Médica Panamericana.
- Maillet M. Histología e histofisiología humanas. Vol. 1: Epitelios de revestimiento. Madrid: Ed Ac 1980.
- McLelland J. Anatomía de las aves. Ed. Interamericana. 1992
- NODEN, D.M. y A. DE LAHUNTA (1990): Embriología de los animales domésticos. Ed. Acribia, Zaragoza.
- Poirier J. Cuadernos de histología. Tomo 2. Madrid: Ed Marbán 1985.
- SCHALLER, O. (1996): Nomenclatura anatómica veterinaria ilustrada. Ed. Acribia S.A., Zaragoza.