1. OVERVIEW

Subject Area	Structure and function III
Degree	Bachelor's degree in veterinary medicine
School/Faculty	Faculty of biomedical and health sciences
Year	Second
ECTS	12ECTS
Type	Core
Language(s)	Spanish
Delivery Mode	On Campus
Semester	First semester

2. INTRODUCTION

Structure and Function III is part of the broader subject of Structure and Function: Biology, Biochemistry, Anatomy and Physiology, and is the third and of three parts of the topic. It is a core subject area. This subject area, worth 12 ECTS, is taught in the first semester of the second year of the Bachelor's Degree in Veterinary Medicine.

The overall aim of this subject area is to introduce students to comparative anatomy, physiology and histology, and to acquaint them with the major biochemical and cell biology processes in animal physiology.

The subject area is divided into four units as follows:

- **UNIT 1.** The Endocrine System.
- **UNIT 2.** The Digestive System.
- **UNIT 3.** The Urinary System.
- **UNIT 4.** The Reproductive System.
- **UNIT 5.** The Integumentary System.

3. SKILLS AND LEARNING OUTCOMES

Basic skills (CB, by its acronym in Spanish):

- CB1 – Show knowledge and understanding of an area of study, building on the foundation of general secondary school education. At this level, and perhaps with the

support of more advanced textbooks, students should be able to demonstrate awareness of the latest developments in their field of study (Knowledge Acquisition).

Cross-curricular skills (CT, by their acronym in Spanish):

- CT2 – Independent learning. Employ appropriate strategies needed to search for, analyse, evaluate and manage information from different sources, and to learn and put into practice what has been learnt independently.
- CT3 – Teamwork. Collaborate actively with other people, departments and/or organisations to reach common goals, value and incorporate contributions from the rest of the group members and create a good working environment.

Specific skills (CE, by their acronym in Spanish):

- CE1b – Knowledge and application of the principles and foundations of: b) the physics, chemistry and biochemistry of biological processes and their applications in veterinary science.
- CE2a – Knowledge and application of the principles and foundations of: a) the structure of eukaryotic cells and their organisation in tissues and organs.
- CE2b – Knowledge and application of the principles and foundations of: b) the morphology, topography and structure of organs and systems.
- CE2d – Knowledge and application of the principles and foundations of: d) the functioning and regulation of body systems and apparatuses.
- CE2f – Knowledge and application of the principles and foundations of: f) ontogenetic development, congenital anomalies and applications of embryology.
- CE2g – Knowledge and application of: g) the molecular and genetic principles and foundations of biological processes.

General skills (CG, by their acronym in Spanish):

- CG2 – Prevent, diagnose and treat animal diseases, particularly zoonoses, both individually and as part of a team.

Learning outcomes (RA, by their acronym in Spanish):

- RA1. Describe the organs of the digestive system and its appendages in the main domestic animal species, with reference to their components, location, relationships, microscopic appearance and function.
- RA2. Identify the general principles of applied biochemistry (clinical enzymology).
- RA3. Describe the organs of the urogenital system in the main domestic animal species, with reference to their components, location, relationships, microscopic appearance and function.
- RA4. Explain hormone regulation in reproduction, and the functioning and regulation of mammary glands.

- RA5. Identify the different types of placenta in domestic species and their functional implications.
- RA6. Describe the location, histological structure and functioning of the organs that make up the endocrine system.
- RA7. Define the basic principles of signal transduction and the regulation of metabolic pathways.
- RA8. Describe the histological structure of skin and the main changes to it.
- RA9. Analyse enzyme systems and the biochemistry of hormones, with reference to their chemical nature, the types and functions of hormones, and the regulation of metabolic pathways.

The following table shows how the skills developed in the subject area relate to the intended learning outcomes:

Skills (CE)	Learning outcomes (RA, by their acronym in Spanish)
CE2a, CE2b, CE2d, CE2f.	RA1
CE1b, CE2f, CE2g.	RA2
CE2a, CE2b, CE2d, CE2f.	RA3
CE2g.	RA4
CE2a, CE2d, CE2f.	RA5
CE2d.	RA6
CE2d, CE2g.	RA7
CE2a, CE2b, CE2f.	RA8
CE1b	RA9

4. CONTENT

The subject area has been divided into four major units that will be taught by means of lectures ("Topic, T"), practicals (labs, workshops; "Practical, P"), theory and practical lessons (TP) and working groups (case studies and cooperative learning; "Working Groups, WG"). The duration of T will be 1h; of P, 1h; and of WG, 2h. To ensure alignment between theory and practice, students will apply theoretical content in various practicals. This will be the method of working for the entire subject area, with Structure and Function lessons taking place in the lab.

UNIT 1. THE ENDOCRINE SYSTEM

The aim of this unit is to describe the location, structure and physiology of the organs that make up the endocrine system; to outline the general principles of clinical enzymology and hormone regulation; to define the principles of signal transduction and the regulation of metabolic pathways; and to analyse enzyme systems and the biochemistry of hormones.

UNIT 2. THE DIGESTIVE SYSTEM

The aim of this unit is to describe the organs of the digestive system and its appendages in the main domestic animal species, with reference to their components, location, relationships, microscopic appearance and function.

UNIT 3. THE URINARY SYSTEM

The aim of this unit is to describe the organs of the urinary system and its appendages in the main domestic animal species, their components, location, relationships, microscopic appearance and function.

UNIT 4. THE REPRODUCTIVE SYSTEM

The aim of this unit is to describe the organs of the reproductive system and its appendages in the main domestic animal species, their components, location, relationships, microscopic appearance and function.

UNIT 5. THE INTEGUMENTARY SYSTEM

The aim of this unit is to define the histological, macroscopic and functional structure of skin and the main changes to it.

5. TEACHING/LEARNING METHODS (MD, by their Spanish acronym)

The types of teaching/learning methods are as follows:

- MD1: Lecture / Web conference.
- MD2: Case studies.
- MD5: Collaborative learning.
- MD6: Learning through workshops/labs.
- MD7: Simulation environments.

6. LEARNING ACTIVITIES

The types of learning activities, plus the amount of time spent on each activity, are as follows:

Learning activity	Number of total hours	Number of hours on campus
AF1: Master lectures	36	36
AF2: Group work (seminars, forums, debates and talks)	14	3.5
AF4: Oral presentations	3	3
AF5: Independent working	130	0
AF6: Workshops and/or labs and/or simulation	68	68
AF8: Drafting reports or concept maps	32.5	0
AF10: Tutorials	14	7
AF11: Assessment tests	2.5	2.5
TOTAL	**300**	**120**

7. ASSESSMENT

The assessment methods, plus their weighting in the final grade for the course, are as follows:

Assessment system	Weighting
Activity 1. Partial Theory Exam 1 (November)	20%
Activity 2. Partial Theory Exam 2 (December)	20%
Activity 3. Partial Theory Exam 3 (January)	20%
Activity 4. Partial Practical Exam 1 (November)	12.5%
Activity 5. Partial Theory Exam 2 (January)	12.5%
Activity 6. Working Groups and Online Simulation Workshops	10%
Activity 7. Oral presentation	5%

8. BIBLIOGRAPHY

The recommended bibliography is indicated below:

- ✓ Anatomy
  - Atlas en color de anatomía veterinaria. El perro y el gato. Done *et al.*
  - Embriología y anatomía veterinaria volumen I y II. Climet *et al.*
  - Anatomía de los animales domésticos: texto y atlas en color. König *et al.*

- ✓ Physiology
  - Fisiología veterinaria. García Sacristán *et al.*
  - Fisiología veterinaria. Cunningham.

- Fisiología de los animales domésticos. Dukes *et al.*
- Veterinary hematology: a diagnosis guide and color atlas. Harvey. Elsevier

✓ Cytology and Histology
- Biología celular y molecular. Lodish *et al.*
- Biología molecular de la célula. Alberts *et al.*
- Textbook of veterinary histology. Dellmann's *et al.*
- Biología celular e histología. Gartner *et al.*
- Diagnostic cytology and hematology of the dog and cat. Tyler *et al.*

✓ Biochemistry:
- Bioquímica. Conceptos esenciales. Feduchi *et al.*
- Clinical biochemistry of domestic animals. Kaneko *et al.* Burlington.

✓ Diagnostic Imaging:
- Small animal radiographic techniques and positioning. Ayers *et al.*
- Small animal diagnostic ultrasound. Thomas G. Nyland *et al.* Elsevier.
- Small animal diagnostic ultrasound. Nyland & Mattoon. Saunders.
- Textbook of veterinary diagnostic radiology. Thrall. Saunders.
- Diagnostic imaging of exotic pets: birds - small mammals – reptiles. Krautwald-Junghanns *et al.*