Course Title
BASIC COMMON FORMATION (5)

<table>
<thead>
<tr>
<th>ECTS</th>
<th>Type</th>
<th>Period</th>
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Course Language
Spanish X Valenciano X English X French

Department
Biomedical Sciences

Specific Area of knowledge
Biochemistry, Compared Anatomy and Pathology, Animal Health, Physiology

Course Coordinator and other Professors

Name
Biochemistry: Begoña Ballester Lurbe (coordinator), Ignacio Pérez Roger
Histology: Mariola Penadés
Anatomy: Deborah Chicharro
Physiology: Ivan Zipancic

Office / Faculty
Begoña Ballester: D156A; Ignacio Pérez: D156C, Seminar Building
Mariola Penadés:
Deborah Chicharro: D-15 Veterinary
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ivan.zipancic@uch.ceu.es

Student appointment schedule
See details in the Intranet

Introduction to the Course
It is intended that students learn the characteristics of the organization and development of domestic animals in general and more specifically the organization and functioning of the nervous system and sense organs. The study of the anatomy, histology and physiology of the nervous system and sensory organs will be undertaken. The application of anatomy to the veterinary clinic will also be introduced. Besides, the main metabolic pathways will be studied.
### Pre-requisites

It is important that students have a good level from Structure and Function I and II

### Course Objectives

Students will:
- Learn the regions of the central nervous system and the main nuclei and tracts that compose it.
- Learn the main structures of the sense organs, especially those forming the organs of sight and hearing.
- Learn the functioning of the central nervous system and sense organs.
- Learn the basics of anatomy applied to the veterinary clinic.
- Learn the metabolic pathways common to all domestic animals (the Krebs cycle, oxidative metabolism and energy production, glycolysis, pentose phosphate pathway, beta-oxidation, transamination and metabolism of the nitrogen bases of nucleotides).
- Learn the basic principles of signal transduction and regulation of the metabolic pathways.
- Learn the general principles of applied biochemistry (enzymology clinic).

### General and Specific Skills Offered by the Course

#### General Skills.

**General Skill 1 (RD861)**
Building on the foundations laid during their secondary education and with the support of advanced textbooks, the students will be able to demonstrate a level of knowledge and understanding equivalent to those at the forefront of their field of study.

**General Skill 2 (RD861)**
Students will be able to apply their knowledge to their work or vocation in a professional manner and possess the skills typically demonstrated through devising and sustaining arguments and solving problems within epidemiology and public health.

**General Skill 4 (RD861)**
Students will gain the opportunity to improve their communication skills via dissemination of information, ideas, problems and solutions to both specialist and non-specialist audiences.

#### Specific Skills.

Specific Skill 2. Knowledge and application of the principles and bases of:
- The morphology, topography and structure of organs and systems.
- The operation and regulation of body apparatus and systems.

Specific Skill 3. Knowledge and application of the principles and bases of:
- The molecular and genetic basis of biological processes.

### Course Contents

**M1: Animal Anatomy (including histology).** Morphology, topography and structure of organs and systems (III).

**M2: Biochemistry.** Molecular basis of biological processes (III).

**M3: Physiology.** Functioning and regulation of body apparatus and systems (III).

### Course Structure and Design

**M1. Animal Anatomy (including histology):**
AF 1.1. Lectures 0,75 ECTS
AF 2.1. Seminars 1,25 ECTS
### Course Structure and Design

#### M2. Biochemistry
AF 1.2. Lectures 1,5 ECTS  
AF 2.2. Seminars 1 ECTS  
AF 4.2. Practicals 0,5 ECTS

#### M3. Physiology
AF 1.2. Lectures 0,5 ECTS  
AF 2.2. Seminars 0,5 ECTS

#### CROSS ACTIVITIES
Extracurricular academic activities: voluntary assistance to *Journal Club* and *CEU Descubre*

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<th>Contact Hours (A)</th>
<th>Independent Study (B)</th>
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<tr>
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### Estimation of Student Workload

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<th>Breakdown of Student Work Hours</th>
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**RELATIONSHIP BETWEEN WORK HOURS AND ECTS CREDITS**

180 hours / 6 ECTS = 30
(The result of dividing the number of work hours by the number of ECTS credits assigned for the course should equal 30 hours as this is the value of 1 ECTS credit at the Universidad CEU Cardenal Herrera)

Assessment Criteria

To pass the course it is necessary:

- To obtain 50% of the overall score, assessing in a balanced way the score for each subject based on the number of assigned ECTS.

- In order to get the overall assessment, it is necessary to obtain at least 40% of the maximum score for each subject, and within it, for each assessment test (except in the "assessments of participation and attendance at tutorials and proposed activities").

ANATOMY (including histology): 33%
- Theory exam 95%
- Participation and attendance to tutorials and proposed activities: 5%

BIOCHEMISTRY: 50%
- Theory exam: 60%
- Preparation and submission of reports: 35%
- Participation and attendance to tutorials and proposed activities: 5%

PHYSIOLOGY: 17%
- Theory exam: 95%
- Participation and attendance to tutorials and proposed activities: 5%

FINAL EXAM (ORDINARY)
Students may take the exam of those subjects to which the minimum required to pass had not been previously obtained.

FINAL EXAM (EXTRAORDINARY)
Students may take the exam of those subjects to which the minimum required to pass had not been previously obtained.

Course Program

Anatomy (including histology)
Nervous system and sense organs. Animal Anatomy applied to the veterinary clinic.

Biochemistry
Metabolic pathways common to all organs and domestic animals are reviewed by biomolecules (the Krebs cycle, oxidative metabolism and energy production, glycolysis, pentose phosphate pathway, beta-oxidation, transamination and metabolism of the nitrogen bases of nucleotides). Basic principles of signal transduction and regulation of metabolic pathways. Applied Biochemistry: clinic enzymology.

Physiology
Nervous system and sense organs.
**Detailed Course Contents**

**BIOCHEMISTRY: METABOLIC PATHWAYS**

**Lectures:**
1. Introduction to energy metabolism
2. Oxidative metabolism: the Krebs cycle.
3. Oxidative metabolism: Oxidative phosphorylation
5. Metabolism of carbohydrates: gluconeogenesis.
7. Regulation of carbohydrates metabolism
11. Lipid metabolism: synthesis of fatty acids and other lipids.
12. Metabolism of nitrogen compounds: transamination and deamination. The urea cycle
13. Metabolism of nitrogen compounds: Degradation and synthesis of amino acids
14. Nucleotide Metabolism

**Seminars:**
- Seminar 1: Tissue metabolism
- Seminar 2: Mechanisms of signal transduction
- Seminar 3: Hormonal regulation of energy metabolism
- Seminar 4: Introduction to clinical biochemistry
- Seminar 5: Problem Based Learning

**Practicals:**
1. Mitochondrial metabolism ("Mitochondria Lab")
2. Clinical Biochemistry

**ANATOMY AND HISTOLOGY: NERVOUS SYSTEM AND SENSES ORGANS**

**Lectures:**
1. Formation of the nervous system
2. Anatomical organization of the spinal cord
3. Anatomical organization of the encephalon: medulla oblongata, pons, cerebellum, diencephalon and brain
4. Meninges and vascularization of the central nervous system
5. Cranial pairs
6. Sense of sight
7. Sense of hearing
8. Histology of the encephalon: medulla oblongata, pons, cerebellum, diencephalon and brain
9. Histology of the spinal cord and peripheral nervous system
10. Histology of senses special organs: eye and ear

**Seminars:**
Applied anatomy and histology of the nervous system: practical examples will be used to expand the knowledge acquired in lectures.

**PHYSIOLOGY: NERVOUS SYSTEM AND SENSES**

**Lectures**
1. Organization and general functions of the central nervous system. Afferent and efferent systems. Integration levels.
### Detailed Course Contents


11. Motor functions of the basal ganglia, cerebellum and cerebral cortex. Movement, balance and posture control.


**Seminars:**
In order to complete, expand or strengthen the contents of the lectures, 5 hours of seminars will be given.

### Basic Bibliography

**BIOCHEMISTRY:**

**ANATOMY AND HISTOLOGY:**

**PHYSIOLOGY:**

### Additional Reading

**BIOCHEMISTRY:**

**ANATOMY AND HISTOLOGY:**
Additional Reading

- FERRIER, D.R. Biochemistry, 6th Ed. Lippincott’s Illustrated Reviews Series. Lippincott, Williams & Wilkins, Baltimore. 2013

Other Support Materials

Recommendations to Students Taking This Course

It is considered very important to attendance to all activities for proper learning in this subject. Beyond the mere presence in the classroom it is essential the involvement of students in the development of the sessions. Therefore, it is very convenient to previously prepare the topics to study and actively participate in the sessions.
Moreover, due to the sequence in which the various contents are reviewed, it is essential to start working from day one.
Finally, students are advised to make use of tutorials and to consult their doubts with the lecturers.

Links to Ongoing Research

Lecturers are involved in research projects related with the subject.

Links to the Veterinary Profession

The acquisition of skills in this subject and the achievement of its objectives will prepare students for further subjects of the curriculum, which require adequate knowledge of the development of the domestic animals, their organization and the way their systems work.
Knowledge and understanding of the "normal" structure and function of animals will facilitate the identification of alterations they may suffer. Similarly, knowledge of the structure of animals will facilitate clinical access when necessary.