

## 28404 - Basic sciences for veterinarians

### Información del Plan Docente

Academic Year	2016/17
Academic center	105 - Facultad de Veterinaria
Degree	451 - Degree in Veterinary Science
ECTS	6.0
Course	1
Period	First semester
Subject Type	Basic Education
Module	---

### 1.Basic info

#### 1.1.Recommendations to take this course

#### 1.2.Activities and key dates for the course

### 2.Initiation

#### 2.1.Learning outcomes that define the subject

#### 2.2.Introduction

### 3.Context and competences

#### 3.1.Goals

#### 3.2.Context and meaning of the subject in the degree

#### 3.3.Competences

#### 3.4.Importance of learning outcomes

### 4.Evaluation

### 5.Activities and resources

#### 5.1.General methodological presentation

#### (E.V) DISCLAIMER

The English version is a translation of the original in Spanish for information purposes only. In case of a discrepancy, the Spanish original will prevail.

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### The learning process is based on

The course is divided into three blocks of different subjects. Each of one of these blocks has 7 hours of lectures, 4 hours of solving cases and problems and 9 hours of laboratory practical lessons.

Before the lectures, students will have the possibility to access to the corresponding material in the learning platform. Then, we carefully recommend a previous reading of this material for better assimilation. The material available to students at the learning platform includes so presentations of the theoretical concepts, as collections of problems proposed for each of them.

In addition students will be provided of the scripts corresponding to the laboratory practical lessons. The problems sessions are working sessions in small groups, the teacher will propose some real problems at the beginning of the session and, at the end of the session will be solved on the board. The practical two-hour sessions will take place in the computer classroom, for maths, analytical chemistry laboratory, for chemistry, and physics laboratory for physics. The student must complete the steps corresponding to the script provided for each practical lesson. Previously, the teacher will explain with an example each one of these steps.

### 5.2.Learning activities

#### PART I: MATHEMATICS

##### Block I. Review of the basic calculus concepts

##### Competences:

1. To be able to know the basic elements related to real functions of real variable, and the meaning of the continuity and derivability in real situations.
2. To be able to intuit the graph of a real function and to interpret it inside of each of the real context, to obtain conclusions about of the evolution of the process this function is describing. Then, to be able to take decisions.

##### Teaching and learning activities:

- Class: 1.5 lecture hours.
- Practical lessons (computer classroom): 1 session of 2 hours.
- Study by the student: 7 hours.

##### Block II. Approximation

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### Competences:

1. To be able to recognize the problems where the analytic solution is not easy and understand the possibility of use the approximation theory to solve them, with a previously fixed precision.
2. To be able to distinguish the problems where the data belongs to a theoretical model, and the others where the data are experimental.

### Teaching and learning activities:

- Class: 3 lecture hours.
- Practical lessons (computer classroom): 2 session of 2 hours.
- Problems: 1.5 hours of problems session at the classroom.
- Study by the student: 14 hours.

### Block III. Elementary discrete models

### Competences:

To be able to understand the equation describing of a population grow. From this equation, to obtain the model of the population grow and the main conclusions about its evolution. To know the basic models of population grow.

### Teaching and learning activities:

- Class: 3.5 lecture hours.
- Practical lessons (computer classroom): 1 session of 2 hours.
- Problems: 1.5 hours of problems session at the classroom.
- Study by the student: 14 hours.

## PART II: CHEMISTRY

### Block I. General Chemistry

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### Competences:

1. To be able to know the different ways of expressing concentration.
2. To be able to transform the different expressions of concentration each other.
3. To be able to understand and resolve the issues that the expression of concentration is involved. Understanding the colligative properties of solutions.
4. To be able to understand and interpret chemical balances. Understanding the operation of the buffers and their operation and importance in living organisms.

### Teaching and learning activities:

- Class: 4 lecture hours.
- Practical lessons (laboratory): 4 sessions of 2 hours.
- Problems: 1.5 hours of problems session at the classroom
- Study by the student: 7 hours.

### Block II. Organic Chemistry

#### Competences:

1. To be able to know the importance of organic chemistry, the characteristics of organic compounds, the different expressions of the molecular formulas.
2. To be able to know the structures of organic compounds. Know the difference between radical, functional group and homologous series. Knowing name and make hydrocarbons and organic compounds with different functional groups.
3. Know the difference between conformational, geometric and optical isomerism. Recognize the asymmetric carbons and chiral molecules. Understand and recognize the importance of chirality in biology..

#### Teaching and learning activities:

- Class: 4 lecture hours.
- Practical lessons (laboratory): 1 session of 2 hours.
- Problems: 1.5 hours of problems session at the classroom
- Study by the student: 14 hours.

### PART III: PHYSICS

#### Block I. Fluids

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### Competences:

- To be able to know the physical basis of fluids applicable to veterinary science.
- To be able to understand the behavior of blood and fluids.

### Teaching and learning activities:

- Class: 4 lecture hours.
- Lab: 2 sessions of 2 hours.
- Problems: 1.5 hours of problem solving at the classroom.

### Block II. Thermodynamics

#### Competences :

In addition to those described in paragraph 3 as generic, the student must acquire the following competences:

- To be able to know the physical basis of thermodynamics that apply to the veterinary science.
- To be able to understand the animal metabolism.
- To be able to understand the thermoregulation processes in animals.

#### Teaching and learning activities:

- Class: 4 lecture hours.
- Lab: 2 sessions of 2 hours. An exam of 1 hour.
- Problems: 1.5 hours of problem solving at the classroom.

## 5.3.Program

### PART I: MATHEMATICS

**Block I.** Review of the basic calculus concepts

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**Topics:** Real functions of real variable. Limits, continuity and derivability. Graphical representation of functions. Basic mathematical functions. Biological models.

### Block II. Approximation

**Topics:** Defining the problem of approximation. Interpolation and Lagrange method. How to fit a function to a data base. Lineal fit and Least Squared method. Other fitting methods.

### Block III. Elementary discrete models

**Topics:** Introduction to the elementary discrete models. Difference equations. Solution of the Difference Equations. Order 1 and 2. Populations grow.

## PART II: CHEMISTRY

### Block I. General Chemistry

**Topics:** Chemical solutions. Colligative properties of solutions. Electrolytes. Chemical equilibria. Acid-base equilibria. Buffer solutions. Amino acids.

### Block II. Organic Chemistry

**Topics:** Introduction to Organic Chemistry. Nomenclature and Formulation of organic compounds. Constitutional isomerism and stereoisomerism.

## PART III: PHYSICS

### Block I. Fluids

**Topics :** Fluid statics. Pressure. Surface phenomena in fluids. Fluid dynamics. Viscosity. Hemodynamics (pressure, flow and resistance)

### Block II. Thermodynamics

**Topics :** Temperature, thermometry. Thermal expansion of solids and liquids. Heat and temperature. Heat capacity. Mechanical equivalent of heat. Internal Energy and the First Law of Thermodynamics. Heat transfer: conduction, convection and radiation. Phase changes and latent heat. Animal metabolism and thermodynamics. Temperature regulation in animals.

## 5.4.Planning and scheduling

## **28404 - Basic sciences for veterinarians**

It can be found on the website of the Faculty.

### **5.5. Bibliography and recommended resources**

<http://psfunizar7.unizar.es/br13/eBuscar.php?tipo=a>