Academic Year/course: 2023/24

28404 - Basic sciences for veterinarians

Syllabus Information

Academic year: 2023/24
Subject: 28404 - Basic sciences for veterinarians
Faculty / School: 105 - Facultad de Veterinaria
Degree: 451 - Degree in Veterinary Science
ECTS: 6.0
Year: 1
Semester: First semester
Subject type: Basic Education
Module:

1. General information

Compulsory basic subject. It contains the subjects of Physics, Mathematics and Chemistry; therefore, it is recommended to take these subjects in the years prior to enrol in the degree. The general objective is to ensure that students acquire a basic scientific training, necessary for the understanding and analysis of the disciplines of the degree. In addition, through computer and laboratory practices, the student will learn to process data and interpret results with a critical sense and scientific reasoning, as well as to present their work reports, in which this critical sense is appreciated, both in the content and in the container of the same. The approaches and objectives are aligned with the Sustainable Development Goals of the United Nations 2030 Agenda.

2. Learning results

The student, in order to pass the subject, must demonstrate that they:

1. It is able to obtain a function that fits a set of data, both theoretical and experimental.

2. Is able to obtain the approximate value of a function at a point, when the function is not known.

3. Is able to identify the mathematical models that describe a system of populations.

4. Is able to classify these models and to obtain the evolution of the population.

5. Is able to use computer tools to solve the problems that arise in the previous sections.

6. Is able to express concentration in its different forms.

7. Is able to identify and interpret chemical equilibria.

8. Is able to identify the structures of organic compounds.

9. Is able to name and formulate hydrocarbons and organic compounds with different functional groups.

10. It is able to distinguish and recognize asymmetric carbons and chiral molecules.

11. Is able to handle the instruments of the chemical laboratory, prepare solutions and work with them.

12. Is able to identify the fundamental quantities of physics such as length, mass, temperature and time that appear in the problems to be solved.

13. Is able to solve problems related to the basic knowledge of Fluids and Thermodynamics necessary for further studies in the degree.

14. Is able to apply the knowledge of physical phenomena acquired in the previous sections to laboratory practices.

15. Is able to report on their work in chemistry and physics laboratories.

3. Syllabus

MATH

Block I. Review of basic concepts of calculus

Descriptors: Real functions of real variable. Limits, continuity and derivability. Graphical representation of functions. Most common mathematical functions. Biological models.

Block II. The problem of approximation

Descriptors: Introduction to the approximation problem. Numerical interpolation. Lagrange's method. Fitting a function to a data set. Linear and least squares adjustment. Other types of adjustment.

Block III. Discrete elementary models

Descriptors: Introduction to discrete elementary models. Equations in differences. Solution of equations in differences. Order 1 and order 2. Examples of populations.

CHEMISTRY

Block I. General Chemistry

Descriptors: Dissolutions. Colligative properties of solutions. Electrolytes. Chemical equilibria. Acid-base equilibria. Buffer solutions. Amino acids.

Block II. Organic Chemistry

Descriptors: Introduction to Organic Chemistry. Nomenclature and formulation of organic compounds. Constitutional Isomerism and Stereoisomerism.

PHYSICS

Block I. Fluids

Descriptors: Fluid statics. Pressure in a fluid. Surface phenomena in liquids. Fluid dynamics. Viscosity. Hemodynamics. Pressure losses in the blood circulation. Hemodynamic resistances.

Block II. Thermodynamics

Descriptors: First Principle of Thermodynamics. Heat and temperature, heat capacities and specific heats. Changes of state and latent heat.

Heat propagation: convection, conduction and radiation. Thermal regulation in living organisms and animal metabolism.

4. Academic activities

The following academic activities will be carried out in all subjects:

Lectures: theoretical and practical presentation of the subject matter. Class participation will be encouraged through problem-based learning.

Practices (computer classroom, chemistry laboratory, physics laboratory): practical sessions of the specific subject.

Problem solving and case solving: approaching and solving problems and cases with a calculator.

Study: autonomous work by the student. These hours include the possible attendance to individualized tutorials.

5. Assessment system

The assessment requires an evaluation for each content block. Both the practical and theoretical skills acquired will be evaluated.

Each subject is assessed independently out of 10 points, according to the following proportion:

Theory - up to 70% of the final grade

Practice - up to 30% of the final grade

In order to pass each subject, it is necessary to obtain a minimum of 40% in each of the parts (theory and practice).

The final grade of the subject will be obtained by averaging the grade of the three subjects, provided that a minimum grade of 4 is obtained in each of them.

Students who have not passed any of the subjects with this methodology of continuous assessment are entitled to a final exam on the official dates announced by the Center, which will include a theoretical and a practical test, with the aforementioned percentages. In any case, every student has the right to take this test at an official call, whose grade will prevail over any grade previously obtained.

In addition,

A grade are between 4 and 5 in one subject (and only one) may be compensated with the rest of the subjects ONLY during the academic year.

The subject that obtains a grade higher than or equal to 5 is considered passed for subsequent years. Practices assessed with a minimum of 40% are considered passed for subsequent years.