1. OVERVIEW

Subject Area	Biotechnology Applied to Veterinary Medicine
Degree	Bachelor's Degree in Veterinary Medicine
School/Faculty	Biomedical and Health Sciences
Year	Second
ECTS	3
Type	Optional
Language(s)	Spanish
Delivery Mode	On-campus
Semester	First semester

2. INTRODUCTION

Many of the 21st century advances in animal health have been made possible thanks to biotechnology. Areas such as animal welfare, diagnostics, preventive medicine, reproduction and food safety have undergone extraordinary developments. During this year, we will explore the most significant advances in biotechnology, the importance of these advances in animal health, and the role of vets in this ever-developing field. This optional subject area is studied in the first semester of the second year (S3) and is worth 3 ECTS.

3. SKILLS AND LEARNING OUTCOMES

Basic skills (CB, by its acronym in Spanish):
- CB5. To develop the learning skills needed to undertake further studies with a high degree of autonomy (Autonomous Learning).

Cross-curricular skills (CT, by their acronym in Spanish):
- CT1. Ethical values. Ability to think and act in line with universal principles based on the value of individuals in order to support their full development, which involves a commitment to certain social values.
- CT5. Analysis and Problem-solving. Assess information critically, address complex situations by breaking them down into their various parts, identify patterns, and consider other alternatives, approaches and perspectives in order to reach the best solutions and effective arrangements.
- CT6. Adaptability. Assume, appreciate and integrate different roles, adapting your approach to the specific situation at hand, and work effectively in situations of uncertainty.
- CT7. Leadership. Lead, motivate and guide people according to their skills and abilities in order to effectively manage their development and common interests.

General skills (CG, by their acronym in Spanish):
- CG6. Carry out professional practice in connection with other health professionals, develop teamwork skills and ensure efficient use of resources and efficient quality management.
- CG7. Identify the risks that arise in all areas of the veterinary profession.

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

- CE2h. Knowledge and application of the principles and foundations of biogenetics and population genetics.
- CE3a. Knowledge and application of the principles and foundations of the study of microorganisms and parasites that affect animals, and of those that are of industrial, biotechnological or environmental use.
- CE4. Knowledge and application of the principles and foundations of:

    d) Bioethics.

Learning outcomes (RA, by their acronym in Spanish):
- Describe the biotech techniques used for the diagnosis of zoonoses and for identifying foodborne pathogens.
- Identify the biotech techniques used for genetic improvement and selective breeding.
- Consider other biotechnological techniques applied in veterinary practice: biotech vaccines, transgenesis and reproductive cloning.
- Apply ethical, bioethical and legal principles in the practice of biotechnology.

- 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)
CB5, CT5, CE3a, CE7e	Describe the biotech techniques used for the diagnosis of zoonoses and for identifying foodborne pathogens.
CB5, CE2h	Identify the biotech techniques used for genetic improvement and selective breeding.
CB5, CT6, CE2h	Consider other biotechnological techniques applied in veterinary practice: biotech vaccines, transgenesis and reproductive cloning.
CB5, CT1, CE4a,c,d,	Apply ethical, bioethical and legal principles in the practice of biotechnology.

4. CONTENT

This subject area is made up of seven topics (T), three simulations (L), three practicals (P), and other tasks such as the submission of essays, one tutorial (Tut) and one colloquium (Co). The learning content is divided into four units: Diagnosis and Prevention, Animal Welfare and Testing, Food Technology, and Animal Reproduction.

UNIT 1. DIAGNOSIS AND PREVENTION

UNIT 2. ANIMAL WELFARE AND TESTING

UNIT 3. FOOD TECHNOLOGY

UNIT 4. ANIMAL REPRODUCTION

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
- MD4: Project-based learning
- MD6: Learning based on workshop/lab teaching

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: Lectures	10	10
AF2: Group work (seminars, forums, debates and talks)	5	1.25
AF4: Oral presentations	1	1
AF5: Independent working	24	0
AF6: Workshops and/or labs and/or simulation	14	14
AF9: Research (scientific/case-based)	15	0
AF10: Tutorials	4	4
AF11: Assessment tests	2	2
TOTAL	**75**	**32.25**

7. ASSESSMENT

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

Assessment system	Weighting
SE1: On-campus theory exams	60%
SE3: Skills and abilities assessment	20%
SE5: Oral presentations	10%
SE6: Research projects	10%

On the Virtual Campus, when you open the subject area, you can see all the details of your assessment tasks, including the deadlines and assessment procedures for each task.

8. BIBLIOGRAPHY

The works of reference for following up this subject area are:
- Animal Biotechnology 1: Reproductive Biotechnologies. Springer (6 septiembre 2019). ISBN-13: 978-3030064075.
- Veterinary Vaccines: Principles and Applications (English Edition) 1o Edición. ISBN-13: 978-1119505952.
- Molecular Diagnostics: Fundamentals, Methods, and Clinical Applications. F.A. Davis Company; Revised edición (22 febrero 2019). ISBN-13: 978-0803668294.
- Fundamentals of Laboratory Animal Science. CRC Press; N.º 1 edición (30 junio 2020). ISBN-13: 978-0367573270.