Universidad Zaragoza

Academic Year/course: 2022/23

28436 - Laboratory Animal Science - II

Syllabus Information

Academic Year: 2022/23
Subject: 28436 - Laboratory Animal Science - II
Faculty / School: 105 - Facultad de Veterinaria
Degree: 451 - Degree in Veterinary Science
ECTS: 3.0
Year:
Semester: Second semester
Subject Type: Optional
Module:

1. General information

1.1. Aims of the course

The subject of Laboratory Animal Science II provides students with complementary knowledge to that studied in the degree, and more closely related to the species most frequently used in experimentation, such as rodents (rats and mice) and rabbits. In this way, it complements the subjects of integration in different species of the same year and others previously studied subjects such as general pathological anatomy, general and propaedeutic pathology, surgical pathology, surgery and anaesthesiology, epidemiology and biostatistics or ethnology and animal welfare.

The general objective of the course is to study the main pathologies and sanitary controls in the most commonly used animal species in experimentation, the most suitable anaesthetic, analgesic, and euthanasic protocols in each of them, the steps to perform a good design and experimental development with animals, as well as the main guidelines for publishing results from animal studies.

These objectives are aligned with the following Sustainable Development Goals (SDGs) of the United Nations 2030 Agenda (https://www.un.org/sustainabledevelopment/es/), in such a way that the acquisition of the learning results of the subject provides training and competence to contribute to some extent to its achievement: Objective 4: Quality education Goal 5: Gender equality Goal 8: Decent work and economic growth Objective 9. Industry, innovation and infrastructures.

1.2. Context and importance of this course in the degree

Laboratory Animal Science II allows students to complete their training in this field in a transversal way, so that after completing the course and the degree, they will have the necessary autonomy to carry out the functions attributed to personnel who perform and design experiments with animals.

1.3. Recommendations to take this course

The student must have passed Laboratory Animal Science I

2. Learning goals

2.1. Competences

After successfuly completing this course, students will be able to:
- Recognize the most frequent pathologies in experimental animals and how to deal with them, both from the point of view of their detection, eradication, and prevention.
- Explain the most relevant anaesthetic, analgesic, and euthanasic procedures in the main experimental animal species, as well as the signs of pain in these species.
- Explain the design stages of a procedure with experimental animals and the aspects to be taken care of in order to comply with the ethical principle of the 3 R's.
- Analyse the scientific literature in which experimental animals are used.

2.2. Learning goals

If students complete the course successfully, they should be able to

- Know the most common pathologies in experimental animals and the basis for establishing the controls that guarantee a high sanitary quality of laboratory animals.
- Know, describe and apply the main anaesthetic, analgesic and euthanasic procedures in the main species of laboratory animals and their influence on animal welfare and experimental results.
- Know how experimental procedures are planned, developed and supervised in the main research areas.
- Apply refinement to the main experimental procedures in surgery and to the procedures for administering substances and obtaining biological samples.
- Apply statistical methods to experimental design.
- Know the information that a scientific article should contain in the field of animal experimentation.

2.3. Importance of learning goals

They make possible to integrate the knowledge of biology, physiology, behaviour and welfare of experimental animals with the pathology and main surgical procedures, sampling and administration of substances. At the same time, it facilitates the global vision in the student about the importance of the good design and refinement of the procedures in which experimental animals participate as a necessary requirement both from the point of view of animal welfare and the obtaining of reliable results in research.

3. Assessment (1st and 2nd call)

3.1. Assessment tasks (description of tasks, marking system and assessment criteria)

Evaluation activities

The student must demonstrate that has achieved the intended learning outcomes through the following assessment activities.

A global exam of the subject, to be taken on the date determined by the Centre, which will assess both theoretical and practical knowledge. It will consist of a written test consisting of 30 multiple-choice questions with 4 answer options. Each right answer is 1 point and wrong answers 0 points. The score will be from 0 to 10.

Valuation criteria and requirement levels

In order to pass the course it will be necessary to obtain a total score of at least 5 points out of a maximum of 10. In accordance with the Regulations for the Evaluation of Learning Standards of the University of Zaragoza.

Marking system:

According to the national regulation Law 1025/2003, 5th of September which lays down the European system of credits and marking system for the university degree.

0-4,9: FAIL.

5,0-6,9: PASS

7,0-8,9: GOOD (NT).

9,0-10: EXCELLENT (SB).

As the article 158 of the Statutes of the University of Zaragoza lays down, provisional grades will be displayed at least for 7 days and students will be able to review them on the date, time and place provided for that purpose.

4. Methodology, learning tasks, syllabus and resources

4.1. Methodological overview

The learning process that has been designed for this subject is based on the following:

- **Lectures:** Participatory lectures will be taught in the classroom to a group of students.
- **Practical classes:** Initially, the teacher will make a short explanation of the session and after that, the students will perform the practice under the permanent supervision of the teachers.

4.2. Learning tasks

- **Lectures:** Theoretical classes (20 hours) will be taught in the schedule established by the Faculty.
- **Practical classes:** A total of 10 hours of practice, distributed in 6 sessions, will be taught in the Laboratory of Physiology, room of Necropsies, Clinic Hospital or in the Computer room. Dates of the practices will be announced in advance, in such a way that the students choose for the date that best suits them.

Summary table of teaching-learning activities

ACTIVITY	ATTENDANCE HOURS	FACTOR	SELF STUDY HOURS	TOTAL
Lectures	20	1,5	30	50
Practices	10	1	10	20
Exams			3	3
Total	30		43	**73**

4.3. Syllabus

The program offered to help the student achieve the expected results includes the following activities:

PROGRAM OF LECTURES

Lectures are divided into 4 thematic blocks, with the timing and assignment of hours listed below.

VI. MICROBIOLOGY AND DISEASE (5 h)

- **Unit 1.** Health monitoring and disease prevention. Health monitoring programme in experimental units.
- **Unit 2.** Pathology of common laboratory animal diseases.
- **Unit 3.** Safety in working with infectious animals.

VII. ANAESTHESIA, ANALGESIA AND EXPERIMENTAL PROCEDURES (9 h)

- **Unit 4.** Introduction to methods of anaesthesia. Anaesthetics and analgesics. Choice of anaesthetic agent in relation to animal species and nature of experiment.
- **Unit 5.** Analgesia. Recognition, assessment and control of pain, suffering or distress.
- **Unit 6.** Euthanasia: chemical and physical methods. Disposal of carcasses.
- **Unit 7.** Experimental procedures in surgery. Principles of surgery, facilities, surgical equipment, aseptic techniques, special perioperative considerations. Postoperative care and monitoring.
- **Unit 8.** Refining procedures for the administration of substances. Biological sampling collection.
- **Unit 9.** Experimental procedures in pharmacology, toxicology, microbiology and infectious diseases.

VIII.

IX. Design and conduct of animal experiments (5 h)

- **Unit 10.** Experimental design. Guidelines for good design. Choice of the experimental animal and power analysis to calculate the number of animals. Statistical analysis and interpretation of results. Designs applied in animal experimentation.

Unit 11. Animal models (spontaneous, induced).

X. ANALYSIS AND ELABORATION OF SCIENTIFIC LITERATURE (1 h)

Unit 12. Analysis and elaboration of scientific literature.

PROGRAM OF PRACTICAL CLASSES

The program consists of 10 hours of practical activities, distributed into 6 sessions:

Only Practice 3 involves working with live animals. This practice has been subjected to prior evaluation by the Advisory Ethics Committee for Animal Experimentation of the University of Zaragoza (License number PD05/14). The carcasses used in Practice 1 and 4 come from animals which have not expressly been euthanized for the practice.

- **Practice 1.** Necropsy in experimental animals. Technique and sampling. Recognition of macroscopic lesions of organs and tissues in the mouse, rat and rabbit (2 hours).

- **Practice 2.** Workshop on pain recognition (2 hours).
- **Practice 3.** Administration of substances. Sample collection in rabbit (1 hour).
- **Practice 4.** Surgical procedures in experimental surgery (2 hours).
- **Practice 5.** Workshop on experimental design of procedures (2 hours).
- **Practice 6.** Evaluation of procedures by ethics committees (1 hour).

4.4. Course planning and calendar

Calendar of attendance sessions

Dates of delivery of the lectures will be available on the website of the Faculty of Veterinary Medicine (link:

http://veterinaria.unizar.es/). This link will be updated at the beginning of each academic year.

Dates of delivery of practical classes will be announced in advance, in such a way that the students choose the best date that suits them.

4.5. Bibliography and recommended resources

http://psfunizar10.unizar.es/br13/egAsignaturas.php?codigo=28436