

## SUBJECT TEACHING GUIDE

### G1942 - Experimental Models of Illnesses

Degree in Biomedical Sciences

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Academic year 2024-2025

1. IDENTIFYING DATA					
Degree	Degree in Biomedical Sciences Degree in Biomedical Sciences			Type and Year	Optional. Year 4 Optional. Year 4
Faculty	Faculty of Medicine				
Discipline					
Course unit title and code	G1942 - Experimental Models of Illnesses				
Number of ECTS credits allocated	6	Term	Semester based (1)		
Web					
Language of instruction	Spanish	English Friendly	No	Mode of delivery	Face-to-face

Department	DPTO. BIOLOGIA MOLECULAR
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### 3.1 LEARNING OUTCOMES

- Identify and apply the different models used in biomedical experimentation .
- Choose the ideal animal, cellular and molecular models to study pathogenic mechanisms or design therapeutic strategies in diseases.
- Apply the production methods of transgenic animals.
- Identify the circumstances that suppose an unnecessary suffering of the experimental animals , applying the necessary methods of analgesia and anesthesia.
- Identify the principles of surgery in experimental animals.
- Choosing and applying minimally invasive surgical procedures in animal experimentation.
- List and apply the bioethical and legal principles of animal experimentation and the use of cell models or genetically modified animals.
- Know the main regulations that regulate the donation, preservation and conservation of human samples, obtained in vivo or post-mortem in the different types of tissue banks .
- Transfer the pathogenic or therapeutic knowledge acquired in the experimental models of diseases to specific clinical situations.

### 4. OBJECTIVES

- Know the legal regulations regarding ethics and animal experimentation.
- Study the essential principles in the care, health and management of experimental animals.
- Know the minimally invasive and surgical procedures in animal experimentation.
- Recognize pain in an experimental animal.
- Study anesthesia and analgesia techniques for animal experimentation.
- Know the bloodless methods of slaughtering animals (euthanasia).
- Know the types of transgenesis and genetic modification procedures in rodents. Analyze disease models developed in experimental animals.
- Know the experimental models of disease in invertebrates.
- Know the basic principles of Banks of tissues, cells and subcellular elements as a possible replacement for animal experimentation.

**6. SUBJECT PROGRAM**

**CONTENTS**

1	<p><b>THEORETICAL PROGRAM IN THREE BLOCKS (42 HOURS)</b></p> <p><b>BLOCK 1. Fundamental contents.</b></p> <ul style="list-style-type: none"> <li>- Spanish legislation on the protection of animals used in experimentation.</li> <li>- Ethics in experimentation with animals and genetically modified organisms.</li> <li>- Rationalization of the use of animals in experimentation. The rule of "three R's".</li> <li>- Fundamental notions in the management and health care of animals for experimentation.</li> <li>- Fundamental notions of biology in experimental animals</li> <li>- Recognition of pain, suffering and anguish in animals.</li> <li>- Bloodless methods of slaughtering experimental animals.</li> </ul> <p><b>BLOCK 2. Specific contents.</b></p> <ul style="list-style-type: none"> <li>- Minimally invasive procedures without anesthesia in rodents and logomorphs.</li> <li>- Anesthesia for minor procedures.</li> <li>- Advanced anesthesia for surgical interventions or long procedures</li> <li>- Principles of surgery in rodents and logomorphs</li> <li>- Management of colonies of transgenic animals.</li> </ul> <p><b>BLOCK 3. Models of human diseases.</b></p> <ul style="list-style-type: none"> <li>- Cancer models</li> <li>- Models of chronic inflammatory diseases</li> <li>- Cardiovascular disease models</li> <li>- Models for the study of pain.</li> </ul> <p><b>CLASSROOM PRACTICES (11 HOURS).</b></p> <ul style="list-style-type: none"> <li>- Discussion sessions of the topics included in the theoretical topics, using demonstrative videos.</li> </ul> <p><b>EXPERIMENTAL LABORATORY PRACTICES (7 HOURS)</b></p> <ul style="list-style-type: none"> <li>- Development of an experimental model of obesity.</li> </ul>
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7. ASSESSMENT METHODS AND CRITERIA				
Description	Type	Final Eval.	Reassessn	%
The students will take two exams on the dates listed in the academic year calendar. Each test has a maximum score of 3,5 points over the final mark. To pass the course it is required to get a minimum of 1,75 points in each of the regular tests and a total	Written exam	No	Yes	35,00
The students will take two exams on the dates listed in the academic year calendar. Each test has a maximum score of 3,5 points over the final mark. To pass the course it is required to get a minimum of 1,75 points in each of the regular tests and a total	Written exam	No	Yes	35,00
Digital platforms could be used such as Socrative o Moodle to evaluate students. An oral examination using phone call or videocall could be used. The exam structure will be announced previously.	Others	No	No	20,00
Laboratory practices: The knowledge acquired in the laboratory practices will be evaluated. The maximum grade may be 10% of the total grade for the course. During the practice, students must complete a series of exercises and questions reflected in the pr	Work	No	No	10,00
TOTAL				100,00
Observations				

The evaluation of this subject has the principle of verifying that the student has acquired the necessary knowledge to receive training for the functions of euthanasia and performance of procedures in animals indicated in Order ECC/566/2015, of March 20, by which The training requirements that must be met by personnel who handle animals used, raised or supplied for experimentation and other scientific purposes, including teaching, are established, published in the BOE dated April 1, 2015.

#### Theoretical classes and Classroom Seminars:

There will be 2 partial written exams that will include approximately 50% of the content of the program each, on the dates that appear in the academic year calendar. Each of the partials will have a maximum value of 35% of the final grade. In order to pass a certain partial, it is required to reach 50% of the maximum mark of each partial. If the student does not pass said qualification in any of the three partial exams, she will be able to recover it in the call extraordinary. The partial qualifications are kept only during the course in which said qualifications were obtained.

#### Structure of partial and extraordinary tests:

The partial exams and the extraordinary exam may consist of different types of questions: multiple answers, questions with a true/false answer, text with gaps to fill in, short answers and development questions, on the contents of the program. In each part, its structure will be announced sufficiently in advance by the teachers in charge of teaching the corresponding subject. In reference to the extraordinary call exam, each teacher will inform the students sufficiently in advance of its structure, which may be different from that of the partial exams, but always containing one of the modalities described above.

#### Laboratory practices:

The knowledge acquired in the laboratory practices will be subject to evaluation. The maximum grade may be 10% of the total grade for the course. During each practice, students must complete a series of exercises reflected in a practice notebook that will be used for evaluation.

Any change of group of practices by the student must have an officially justified reason, and the responsible teacher will be requested sufficiently in advance, so that he authorizes it if he considers the reason for the change duly justified.

Attendance and participation in practices (classroom or laboratory) is mandatory and absences must be duly justified according to regulations, those that are not justified in this way will be penalized in the final grade of the practice. Given the impossibility of attending practices, it is recommended to contact the responsible teacher sufficiently in advance.

The evaluations of the laboratory practices are not recoverable. Repeating students will not have to repeat the laboratory practices. The grade obtained by the student in the laboratory practice exam will be kept for successive courses, if that were the student's desire.

#### Continuous assessment:

It will be carried out through brief development questions or multiple choice questions at the end of the presentation of the main thematic blocks, both in theoretical classes and in classroom practices. Digital tools may be used to carry out a continuous evaluation that will form part of the final grade. The maximum grade that can be obtained with this type of evaluation will be 20% of the final grade for the subject.

#### Final score.

To pass the subject, the total sum of marks obtained in the different tests must be equal to or greater than 50% of the maximum possible mark. In the event that in any partial the grade would have been less than 50% of the maximum of that partial exam, and regardless of the total numerical sum of the grades, it will be considered that the student has not passed the subject, for which reason they must recover in the extraordinary call.

Adaptation in the event that the situation does not allow the teaching activity to be carried out in person: Digital platforms such as Moodle may be used to carry out an evaluation with virtual support if necessary, which will be announced in advance to the students, together with the structure of the exam. The teaching staff will indicate to the students if it is necessary to use any other platform for the development of the evaluation. In addition, teachers will be able to take an oral exam using a phone call or videoconference. The structure of said exam will also be detailed to the students in advance.

Following the Regulations for Evaluation Processes at the University of Cantabria, teachers will request that the student prove their identity through a video call or by sending an email. Videoconferencing tools, which may be recorded as evidence of the course of the evaluation, may be used to monitor the evaluation. In the event that there are problems with the use of the platform during the evaluation, teachers may carry out an oral exam for those students who cannot complete the evaluation.

The students will receive instructions for the adaptation of the classroom practices to a format of lack of attendance in the

classrooms.

Observations for part-time students

Part-time students must attend all compulsory practices and take the assessment described for the rest of the students.

## 8. BIBLIOGRAPHY AND TEACHING MATERIALS

### BASIC

1. Zúñiga JM, Orellana JM, Tur JA. Ciencia y Tecnología del Animal de Laboratorio. Ed Universidad de Alcalá de Henares, 2008.
2. Página Web de las siguientes asociaciones:
  - Federation of European Laboratory Animal Science Associations : <https://felasa.eu/education-training>
  - Association for Assessment and Accreditation of Laboratory Animal Care (AAALAC): <https://www.aaalac.org/>
  - Sociedad Española para las Ciencias del Animal de Laboratorio : <https://secal.es/>