



Universitat de Lleida

DEGREE CURRICULUM  
**THE BIOTECHNOLOGY IN  
PRODUCTION AND ANIMAL  
HEALTH**

Coordination: ROJAS CAÑADAS, EBER

Academic year 2023-24

## Subject's general information

<b>Subject name</b>	THE BIOTECHNOLOGY IN PRODUCTION AND ANIMAL HEALTH				
<b>Code</b>	101631				
<b>Semester</b>	2nd Q(SEMESTER) CONTINUED EVALUATION				
<b>Typology</b>	<b>Degree</b>	<b>Course</b>	<b>Character</b>	<b>Modality</b>	
	Bachelor's Degree in Biotechnology	4	OPTIONAL	Attendance-based	
<b>Course number of credits (ECTS)</b>	6				
<b>Type of activity, credits, and groups</b>	<b>Activity type</b>	PRACAMP	PRALAB	PRAULA	TEORIA
	<b>Number of credits</b>	1	0.8	1.4	2.8
	<b>Number of groups</b>	1	1	1	1
<b>Coordination</b>	ROJAS CAÑADAS, EBER				
<b>Department</b>	ANIMAL SCIENCE				
<b>Teaching load distribution between lectures and independent student work</b>	Presential Hours: 60th Non presential hours: 90th				
<b>Important information on data processing</b>	Consult <a href="#">this link</a> for more information.				
<b>Language</b>	English 95% Spanish 5%				

Teaching staff	E-mail addresses	Credits taught by teacher	Office and hour of attention
BLANCO PENEDO, MARIA ISABEL	isabel.blancopenedo@udl.cat	3,12	
LÓPEZ HELGUERA, IRENE	irene.lopez@udl.cat	,6	
MORENO MARTINEZ, JOSE ANTONIO	joseantonio.moreno@udl.cat	,48	
ROJAS CAÑADAS, EBER	eber.rojas@udl.cat	3	

## Subject's extra information

### Recommendations

Understanding English

## Learning objectives

The aim of the course is to offer to students who already have knowledge of Animal Physiology, Virology and Immunology, the range of possibilities of biotechnology in production and animal health. We study the benefits of biotechnology in the prevention, diagnosis, control and eradication of animal diseases. We pay special attention to zoonoses (diseases that can be transmitted to humans) and knowledge on the official regulations for farmers to improve animal health and food safety.

Students who pass the course will be able to:

- Learn about the basics of production and animal health, including zoonoses.
- Understand and know the benefits of biotechnology in the prevention, diagnosis, control and eradication of animal diseases (new vaccines and new diagnostic tests)
- Understand and know the benefits of biotechnology in animal reproduction

### Students who pass the subject should be able to: (Objectives capacity)

Use materials and equipment suitable for laboratory diagnosis and control of reproduction and of animal diseases.

## Competences

### General skills

GC1 Being able to selectively search for and use sources of information necessary to achieve the training objectives.

GC2 Interpret scientific-technical information with a critical sense, and be able to make presentations based on this information.

GC3 Working in a team, with a multidisciplinary vision and with the ability to make a rational and efficient distribution of tasks among team members.

GC4 Knowing and adequately using the scientific and technical vocabulary of the different areas of Biotechnology.

## **Transversal skills**

CT1 Being able to produce comprehensible written and oral reports on the work carried out, with a justification based on the theoretical-practical knowledge obtained.

CT2 To be able to communicate and communicate in the international sphere in their professional development.

CT3 To use information and communication tools and techniques for data analysis and the preparation of oral and written reports and other training and professional activities.

## **Specific skills**

CE22 Acquire a precise knowledge of the basic principles and physiological mechanisms of animal and plant organisms.

CE45 To know the diversity of living beings, the importance of their maintenance and the management strategies from the biotechnological field.

## Subject contents

### PART 1.

**Item 1.** Introduction to Animal Production Systems. Definition of livestock farm. 2h

**Item 2.** Basic knowledge of extensive and intensive livestock. 2h

**Item 3.** Basic knowledge of dairy cattle farms. 2h

**Item 4.** Basic knowledge of intensive beef cattle. 1h

**Item 5.** Basic knowledge of pig farms and their management. 2h

**Item 6.** Basic knowledge of sheep and goats farms 2h

Students will make public presentations. The number of students per group will depend on the number of students in class. They will present a paper during 10 min. like in a Congress communication. 8 h

### PART 2.

**Item 7.** Introduction to reproductive biology. 2h

**Item 8.** The organization and function of the female and male reproductive system. 2h

**Item 9.** Endocrinology of male and spermatogenesis. 2h

**Item 10.** Endocrinology of female and estrus cycle. 2h

**Item 11.** Pregnancy and parturition 3h

**Item 12.** Factors affecting fertility and embryonic survival 1h

### Practical activities

#### PART 1

**Practice 1.** Visit to a Agriculture School de Vallfogona de Balaguer.

**Practice 2.** Portfolio in animal health. 4h

**Practice 3.** Extramural practice: Facilities and biosafety in research with rodents (Rodent Animal Facility UdL-Campus Medicina). 4h <http://www.udl.es/recerca/oficina/sct/serveis/estabulari.html>

<http://www.udl.cat/recerca/oficina/newsletter/documents/Estabulari.pdf>

#### PART 2

**Practice 4.** Anatomy and histology of female and male reproductive system. 2h

**Practice 5.** Semen evaluation methods in cattle. 2h

**Practice 6.** Synchronization technologies of estrus and ovulation 2h

**Practice 7.** Ultrasound scan technology associated to animal reproduction. 2h

## Methodology

Type of activity	Description	Classroom Student work		Student Work outside of the classroom		Evaluation	Total Time
		<b>Objectives</b>	<b>Hours</b>	<b>Student work</b>	<b>Hours</b>	<b>Hours</b>	<b>Hours</b>
<b>Lectures</b>	Lecture (Class. Large group)	Explanation of the main concepts	<b>28</b>	Study: Learn, understand and synthesize knowledge	<b>28</b>	4	<b>60</b>
<b>Problems and cases</b>	Class participation (Class. Large group)	Problem solving	<b>0</b>	Learning how to solve problems	<b>0</b>		<b>0</b>
<b>Seminars</b>	Class participation (Medium- sized group)	Activities of discussion or implementation	<b>0</b>	Problem solving and discussion	<b>0</b>		<b>0</b>
<b>Lab</b>	Laboratory Practice (Medium- sized group)	Implementation of the practice: to fully understand, measure ...	<b>8</b>	Study and monography writing	<b>8</b>	1	<b>17</b>
<b>Computer room</b>	Computer classroom practice (Medium- sized group)	Implementation of the practice: to fully understand, measure ...		Study and monography writing			
<b>Field Work</b>	Practice Fieldwork (Medium- sized group)	Implementation of the practice: to fully understand, measure ...	<b>0</b>	Study and monography writing	<b>0</b>		<b>0</b>
<b>Visits</b>	Visit farms or industries	Making the Visit	<b>15</b>	Study and monography writing	<b>5</b>		<b>20</b>
<b>Guided Activities</b>	Student work (individual or group)	Guiding Student study (in tutoring hours)	<b>9</b>	bibliographic work, study, etc.	<b>40</b>	4	<b>53</b>
<b>Others</b>							
<b>Totals</b>			<b>60</b>		<b>78</b>	<b>9</b>	<b>150</b>

## Development plan

The course is structured in two blocks of knowledge that include theoretical and practical laboratory activities, seminars and visits. The calendar developed by the Directorate of Studies will be strictly followed.

**Theoretical activities** will be taught in person or non-presential through the Virtual Campus videoconference tool.

**The practical activities** will be face-to-face:

- Dissection room and Histophysiology Laboratory: ETSEA, building 1, floor 0, laboratory 1 (1.0.01).
- Microscope classroom: ETSEA, SHV building, floor 2, classroom 02 (2.2.02).
- Computer room.

It is MANDATORY that students wear the following personal protective equipment (PPE) during the teaching practices:

- White lab coat.
- Chemical / biological protection gloves (Physiology block)

The development plan will be found in the resource folder.

**NOTE - Please be aware of changes regarding schedules in the classroom or virtualization of activities to adapt to any change in the health situation.**

## Evaluation

There will be 3 parts: Teorical part I (I Blanco); Teorical part II (E Rojas) and Practices & Case Studies problems:

Bellow students can depict the pattern whisch will be followed.

In order to overcame the module, sutudents must obtain a score >4.5 in the two parts of Production and Reproduction.

The controls will assess the knowledge of the concepts explained therewith the work carried out by the student in the acquisition of the knowledge and the ease of locating the dins of the biological knowledge that the degree requires.

The assessment will be a typical multiple-choice question test and the practical exam will be short questions that must be answered after finishing practical session..

There will be the possibility of an alternative evaluation in case the student there indicates that they will be able to have a month of gener on all the parts will be evaluated together in a single exam of theory of type tests and a number of practices

Exams	Practices	Case studies and problems	Other activities
60%	26%	14%	

Activity type	Grading System		Grading weight
	<b>Procedure</b>	<b>Number</b>	<b>(%)</b>
<b>Lectures</b>	Written tests on theory syllabus	2	<b>60</b>
<b>Problems and cases</b>	Paper delivery or exams about test cases	8	<b>26</b>
<b>Seminars</b>	Written or oral evidence	0	
<b>Lab</b>	Delivery reports, written or oral evidence	0	
<b>Computer room</b>	Delivery reports. Written or oral tests.		
<b>Field Work</b>	Delivery reports. Written or oral evidence	4	
<b>Visits</b>	Delivery reports. Written or oral tests.		
<b>Guided Activities</b>	Delivery of work	1-2	<b>14</b>
<b>Others</b>			
<b>Total</b>			<b>100</b>

### SUMMARY of EVALUATION

**Exams:** 60% (30% I. Blanco and 30% E.Rojas). Classes + Questions related to your own presentation and other presentations at your choice (I. Blanco)

**Practices:** 26 % (13% I.Blanco +JA.Moreno and 13% E Rojas + I.López). Presentation evaluation+ Attendance + test of each practice or visit (I. Blanco) . Attendance, tests.... (B.Serrano)

**Cases and problem analysis:** 14% (7% I. Blanco and 7% E.Rojas). Portfolio in animal health (I. Blanco) and Poster presentation (E.Rojas)

## Bibliography

### Textbooks

Malik P.K. et al.2015. Livestock production and climate change.  
<http://www.cabi.org/cabdirect/FullTextPDF/2015/20153123668.pdf>

MACKENZIE AA 2005. Biotechnology Applications in Animal Health and Production. OIE FAO. 1989  
 Biotechnology for Livestock Production.

FAO / IAEA. In 2005. Molecular Diagnostic PCR Handbook "(Handbook of Molecular Diagnostics the mediante PCR), edited by GJ Viljoen, LH Nel and JR Crowther. Springer Publishers

FAO / IAEA. 2005 Applications of gene-based Technologies for Improving Animal Production and health in developing countries. Ed by HPS Makki and GJ Viljoen Senger PL. Current Conception, Inc..., 2006.

MJ FIELDS, SAND RS YELICH JV. Factors affecting calf crop. Biotechnology of Reproduction. CRC Press, 2002.

GORDON I. Cabi Publishing, 2004.

PRESICCE, GA (2020). Reproductive Technologies in Animals. Academic Press  
<https://doi.org/10.1016/C2018-0-01374-2>

### Further reading



Scientific articles in the "recursos" folder of the subject