



Universitat de Lleida

DEGREE CURRICULUM

THE BIOTECHNOLOGY IN PRODUCTION AND ANIMAL HEALTH

Coordination: SERRANO PEREZ, BEATRIZ

Academic year 2022-23

Subject's general information

Subject name	THE BIOTECHNOLOGY IN PRODUCTION AND ANIMAL HEALTH			
Code	101631			
Semester	1st Q(SEMESTER) CONTINUED EVALUATION			
Typology	Degree	Course	Character	Modality
	Bachelor's Degree in Biotechnology	4	OPTIONAL	Attendance-based
Course number of credits (ECTS)	6			
Type of activity, credits, and groups	Activity type	PRACAMP	PRALAB	PRAULA
	Number of credits	1.3	0.8	1.1
	Number of groups	1	1	1
Coordination	SERRANO PEREZ, BEATRIZ			
Department	ANIMAL SCIENCE			
Teaching load distribution between lectures and independent student work	Presential Hours: 60th Non presential hours: 90th			
Important information on data processing	Consult this link for more information.			
Language	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	2,6	
LOPEZ HELGUERA, IRENE	irene.lopez@udl.cat	,5	
MORENO MARTINEZ, JOSE ANTONIO	joseantonio.moreno@udl.cat	,4	
ROJAS CAÑADAS, EBER	eber.rojas@udl.cat	1,1	
SERRANO PEREZ, BEATRIZ	beatriz.serrano@udl.cat	1,4	

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

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

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

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

Total			100
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SUMMARY of EVALUATION

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

Practices: 26 % (13% I.Blanco +JA.Moreno and 13% B.Serrano + 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% B.Serrano). Portfolio in animal health (I. Blanco) and Poster presentation (B.Serrano)

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