

Course Unit	Animal biotechnology	Field of study	Biology and biochemistry/Animal and agrarian production		
Bachelor in	Biology and Biotechnology	School	School of Agriculture		
Academic Year	2019/2020	Year of study	2	Level	1-2
Type	Semestral	Semester	1	ECTS credits	6.0
Code	9029-510-2102-00-19				
Workload (hours)	162	Contact hours	T 30	TP -	PL 30
			TC -	S -	E -
			OT 4	O -	

T - Lectures; TP - Lectures and problem-solving; PL - Problem-solving, project or laboratory; TC - Fieldwork; S - Seminar; E - Placement; OT - Tutorial; O - Other

Name(s) of lecturer(s) Teresa Maria Montenegro Araújo A. Correia, Vasco Augusto Pilão Cadavez

### Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:

1. Animal Biotechnology is the use of science and engineering to modify living organisms and animal production systems or processing animal products.
2. Understand how biotechnology operates at the level of technological processing of animal products
3. Students should know the main reproductive technologies used in animals, their use and their limitations.
4. Learn about the latest advances and use in transgenic animals.

### Prerequisites

Before the course unit the learner is expected to be able to:

1. Computer skills.
2. Knowledge of biology.
3. Knowledge of classical and molecular genetics.
4. Knowledge of genetic engineering.

### Course contents

Animal Biotechnology intends to implement new biotechnology in four main areas:

- 1- Improvement of animal products
- 2- Improve animal health and welfare
- 3- Increased reproductive efficiency of animals.
- 4- Use of transgenic animals for different purposes.

### Course contents (extended version)

1. Guidelines for the curricular unit.
2. The technology of animal reproduction.
  - Female genital tract and estrous cycles.
  - Male genital tract.
  - Control of ovarian activity.
  - Semen technology.
  - In vitro fertility.
  - Preservation and embryo transfer.
  - Cloning.
3. Transgenic Animals. Different purposes.
4. Biotechnology in animal production. Characterization of the different productions.
  - Biotechnology of meat and its products.
  - Biotechnology of milk and its products.
  - Innovation and creation of new animals products.

### Recommended reading

1. Seneda, M; Silva Santos, K.and Marinho, L., 2016 Biotechnology of Animal Reproduction. nova Science Publishere. New York.
2. Safety of Genetically Engineered Foods: approaches to Assessing Unintend Health Effects. Institute of Medicine (US) committee on identifying and assessing Unintended
3. Shenoy M. (2007) Animal Biohectnology by Firewall Media. 01/01/2007
4. Xiaoling, C.; Zhiqing, H. Gang, J. Xiuqun, W.,&Caimel, W. (1 of april, 2012). Biblioteca do conhecimento on line Http://dx doi.otg/10.1080/104953982011.630897
5. Tizard, M.; Hallerman, E.; Fahrenkung, S.....2016. Strategies to enable the adoption of animal biotechnology to sustainably improve global food safety and security. Transgenic Research, 575-595

### Teaching and learning methods

Theoretical lessons on fundamental concepts with complemented illustrative examples. Practical lessons with conducting protocols depicting some of the techniques used in biotechnology. TIC, namely virtual, and both auditory and visual stimuli are used to promote augmented learning.

### Assessment methods

1. Continuous evaluation - (Regular, Student Worker) (Final)
  - Intermediate Written Test - 50% (Minimum mark 8.5.)
  - Presentations - 30% (Presentation of a development theme.)
  - Final Written Exam - 50% (Minimum mark 8.5.)
2. Final exam - (Regular, Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100% (Final exam with theoretical part (80%) and practical (20%).)

### Language of instruction

Portuguese, with additional English support for foreign students.

## Electronic validation

Teresa Maria Montenegro Araújo A. Correia, Vasco Augusto Pilão Cadavez	Marieta Amélia Martins Carvalho	Joaquina Teresa Gaudêncio Dias	Alfredo Jorge Costa Teixeira
14-11-2019	14-11-2019	15-11-2019	16-11-2019