

Course Unit	Veterinary Diagnostic Techniques	Field of study	Veterinary Science
Bachelor in	Veterinary Nursing	School	School of Agriculture
Academic Year	2023/2024	Year of study	2
Type	Semestral	Semester	2
Workload (hours)	162	Contact hours	T - TP - PL - TC - S - E - OT - O -
		Level	1-2
		Code	9085-783-2205-00-23
		ECTS credits	6.0

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) Hélder Miranda Pires Quintas, Joaquina Teresa Gaudêncio Dias, Manuel Ricardo Costa Calhelha

### Learning outcomes and competences

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

1. Provide knowledge of different diagnostic methods / techniques based on DNA technology.
2. Know the advantages and limitations presented by different techniques, as well as their levels of sensitivity, specificity and main applications.
3. Know the most important applications for animal cell culture.
4. Perform correctly the main procedures used in animal cell culture.
5. Learn the fundamentals of diagnosis auxiliary methods: radiography, ultrasonography, alternative imaging technologies and electrocardiography. Be aware of their potentials and risks.

### Prerequisites

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

The students should have previous knowledge of biochemistry, physiology, histology and genetics.

### Course contents

Radiology. Computed Axial Tomography. Magnetic resonance. Ultrasound. Echocardiography. Scintigraphy. Electrocardiograms. Molecular techniques of diagnosis. Pathogen detection techniques. Molecular typing. Automation and sequencing platforms of the new generation. Animal cell culture applications.

### Course contents (extended version)

1. Molecular diagnostic methods
  - A-TECHNIQUES OF MOLECULAR BIOLOGY
  - Isolation and purification of nucleic acids. Electrophoresis.
  - B- Molecular diagnostic techniques
  - PCR based methods. The polymerase chain reaction (PCR). Principles .
  - Variants. Advantages and limitations. RAPDs. Multiplex PCR. rep-PCR. PCR-RFLP. ARDRA
  - Methods based on the use of restriction enzymes
  - DNA Hybridization
  - DNA sequencing. Manual and automatic sequencing.
2. Culture of animal cells: basic technique.
  - Animal cell biology
  - Equipment, consumables and reagents used in animal cell culture
  - Culture and subculture of animal cells: isolation, primary cultures and cell lines
  - Characterization and stipulation of cell lines
  - Animal cell culture applications
3. Radiography
  - The principles of physics used in radiography
  - Radiation safety
  - General principles of positioning
  - Alternative imaging radiography
4. Ultrasonography: principles and technique
5. Electrocardiography: principles and technique

### Recommended reading

1. Brown, M. , Brown, L. , 2021. Lavin's Radiography for Veterinary Technicians. 7th edition, Elsevier - Health Sciences Division, EUA, 672 pp.
2. Marolf, A. , 2016. Diagnostic Radiology, an Issue of Veterinary Clinics of North America: Small Animal Practice. Elsevier - Health Sciences Division, Filadélfia, EUA, 608 pp.
3. Freshney, R. , 2016. Culture of Animal Cells: A Manual of Basic Technique and Specialized Applications. 7ª edição, John Wiley & Sons Inc, NY, EUA, 728 p.
4. Mattoon, J. , Sellon, R. , Berry C. 2021. Small Animal Diagnostic Ultrasound. 4th edition. Saunders Elsevier - Health Sciences Division, Filadélfia, EUA, 752 pp.
5. Quinn, P. , Markey, B. , Carter, M. , Donnelly W. , Leonard, F. , 2011. Veterinary Microbiology and Microbial Diseases. Wiley-Blackwell, NJ, EUA, 928 pp.

### Teaching and learning methods

Lectures will be support by media and multimedia resources. Practical classes will engage direct working with animals and laboratory practices. Everyone is expected to contribute actively to discussions. Non present hours will involve training in a working environment. Graduate students are expected to work largely on their own initiative although with the close support and supervision of a tutor.

### Assessment methods

1. Coursework - (Regular) (Final, Supplementary, Special)
  - Intermediate Written Test - 50% (1st written exam)
  - Intermediate Written Test - 25% (2nd written exam)
  - Intermediate Written Test - 25% (3th written exam)
2. final written exam - (Student Worker) (Final, Supplementary, Special)
  - Final Written Exam - 100% (Final written exam)

### Language of instruction

Portuguese

## Electronic validation

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16-01-2024	16-01-2024	17-01-2024	17-01-2024