Course Unit	Microbiology and Immunology			Field of study	Biology and Biochemistry		
Bachelor in	Veterinary Nursing			School	School of Agriculture		
Academic Year	2023/2024	Year of study	1	Level	1-1	ECTS credits	6.0
Type	Semestral	Semester	1	Code	9085-783-1105-00-23		

Workload (hours)	162	Contact hours	T -	TP -	PL -	TC -	S -	E -	OT -	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): Joaquina Teresa Gaudêncio Dias

Learning outcomes and competences

At the end of the course unit the learner is expected to be able to:
1. To understand the mechanisms evolved in interactions between microorganisms and environment, humans and animals.
2. To correlate the physiological characteristics of microorganisms with pathogenicity.
3. To understand the basic concepts of infection, epidemiology, immunity, diagnosis, pathogenicity, prevention and chemotherapy of microbial infections

Prerequisites

Before the course unit the learner is expected to be able to:
Not applicable

Course contents

Taxonomy. Morphology and structure of bacteria and fungi . Nutrition and growth. Human microbiome and its influence on health . Cells and organs of immune system ; antigens, antibody and TCR. Complement. Humoral and cellular immunity. Hypersensitivity, tolerance/auto-immunity. Laboratory classes: Control of microorganisms; pure culture and staining techniques; microbial growth; microbial susceptibility to chemotherapeutic agents; total and differential counting of leukocytes, immunoprecipitation and immunodiffusion tests.

Course contents (extended version)

1. Microbiology as a science.
2. Procaryotic cell structure and morphology
3. Classification system . of living organisms.
4. Cultivation and growth of microorganisms.
5. Bacterial pathogenecity
   - Human microbiome /gut microbiome
6. Overviews of the immune system
7. Immunity and the immune response.
8. Hematopoiesis. Cells and organs of the immune system.
9. Humoral and cellular immunity. Antigens. Antibody – structure and classes.
10. Inflammation.
11. MHC molecules and genes. Antigen processing and presentation.
12. Immediate and delayaed hypersensivity.
13. Cells and colonies morphology. Preparation of culture media and sterilization.
14. Pure culture techniques. Staining techniques. Microbial susceptibility to chemotherapeutic agents.
    - identification of S. aureus coagulase positive from milk samples
15. Wright`s staining of leucocytes. Counting of leucocytes and erythrocytes.

Recommended reading

1. Barroso et al. 2014. Microbiologia Médica. Lidel Edições técnicas, Volume I e II.
2. Ferreira et al. 2010. Microbiologia. Lidel Edições Técnicas, Volume I e II.
3. Quinn et al. , 2015. Concise Review of Veterinary Microbiology. 2ª edição. John Wiley & Sons Inc.
4. Day, M. , Schultz, R. , 2014. Veterinary Immunology: Principles and Practice. 2ª edição, Taylor & Francis Ltd.
5. Tizard, I. 2012. Veterinary Immunology: An Introduction. 9ª edição, Elsevier - Health Sciences Division.

Teaching and learning methods

Conventional lectures; use of power point presentations and internet resources. Laboratory classes. Course materials available in the e-learning plataform.

Assessment methods

1. coursework - (Regular) (Final, Supplementary, Special)
   - Intermediate Written Test - 30% (1st written exam)
   - Final Written Exam - 30% (Final written exam)
   - Practical Work - 40% (Written laboratory exam)
2. Final written exam - (Regular, Student Worker) (Final, Supplementary, Special)
   - Final Written Exam - 100% (written exam)

Language of instruction

Portuguese

Electronic validation

Joaquina Teresa Gaudêncio Dias	Maria Letícia Miranda Fernandes Estevinho	Hélder Miranda Pires Quintas	Paula Cristina Azevedo Rodrigues
07-02-2024	07-02-2024	07-02-2024	10-02-2024