

Course Unit	Microbiology and Immunology		Field of study	Biology and Biochemistry	
Bachelor in	Veterinary Nursing		School	School of Agriculture	
Academic Year	2022/2023	Year of study	1	Level	1-1
Type	Semestral	Semester	1	ECTS credits	6.0
Workload (hours)		162	Contact hours	T 30   TP -   PL 30   TC -   S -   E -   OT 20   O -	
Code 9085-671-1105-00-22					

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 leucocytes, immunoprecipitation and immunodiffusion tests.

### Course contents (extended version)

1. Microbiology as a science.
2. Prokaryotic cell structure and morphology
3. Classification system . of living organisms.
4. Cultivation and growth of microorganisms.
5. Bacterial pathogenicity
  - 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 delayed hypersensitivity.
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 platform.

### 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
14-12-2022	14-12-2022	16-12-2022	18-12-2022