

MICROBIOLOGY 3

Study program	Veterinary Medicine
Year of study	II
Semester	II
Regime of discipline	DOB
Category of discipline	Dsf
Number of lectures hours per week	2
Number of seminar/laboratory/project hours per week	3
Total number of hours according to the curriculum: lectures/seminars/laboratory/project	28 hours of course/ 42 hours of laboratory
Number of transferable credits	5

SPECIFIC SKILLS

Professional Competence	<p>Acquiring knowledge regarding the taxonomy and nomenclature of bacteria and viruses. Specifying the appropriate techniques for examining morpho-cultural characters, isolating and identifying the main bacterial species with implications in the etiology of infectious diseases in animals.</p> <p>Acquiring knowledge regarding the structure and functions of viruses and the notions of normal and pathological viral ecology. Knowledge of the elements of viral genetics and the mechanisms by which genotypic and phenotypic variations can occur. Understanding the growth, development and multiplication of pathogenic viruses for animals.</p> <p>Specifying diagnostic methods in bacterial and viral diseases. Elaborating protocols and specific methods for preventing and combating diseases with bacterial and viral etiology. Specifying methods for treatment, prophylaxis and combating diseases caused by bacteria and viruses in animals.</p> <p>Classification and description of the main groups of pathogenic bacteria and viruses for animals.</p> <p>Using scientific research to describe the emergence and spread of bacterial and viral diseases in order to issue effective strategies for their prevention and control.</p>
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LEARNING OUTCOMES

Knowledge	The student explains the concepts regarding the morphology, taxonomy and pathological implications of each group of bacteria and viruses, the methods of microbiological diagnosis of specific diseases and their evolution at the population level.
Skills	The student applies microbiological diagnostic methods and identifies bacteria and viruses. He also estimates the evolution of a disease at the population level and its zoonotic potential.
Responsibility and autonomy	The student determines and identifies pathogenic microorganisms in animals and evaluates the evolution of the disease. He also analyzes and evaluates the evolution of a disease at the population level.

COURSE OBJECTIVES

General objective of the course	To convey knowledge regarding the morphology and structure of pathogenic microorganisms in domestic animals, aspects of pathogenesis of the development of microbial diseases, including aspects of epidemiology, prophylaxis and control.
Specific objectives	<ul style="list-style-type: none"> - Familiarizing students with the method of collecting samples for laboratory analysis and the conduct to be followed. - Identifying the elements of bacterial genetics and the mechanisms by which genotypic and phenotypic variations can occur in bacteria - Familiarizing students with the notions of taxonomy, taxonomic criteria and nomenclature of bacteria. - Mentioning the main characters used to identify bacteria, including the mechanisms of pathogenesis present in bacteria. - Presentation of the general notions of immunoprophylaxis and immunotherapy of diseases caused by bacteria. - Description and characterization of the main groups (families, genera, species) of pathogenic bacteria for animals. - Familiarizing students with aspects of morphology and infrastructure of pathogenic viruses for animals. - Acquisition by students of elementary notions regarding taxonomy and taxonomic criteria that underlie the classification of pathogenic viruses for animals. - Understanding the mechanisms of virus replication by inoculation in susceptible animals, cell cultures and embryonated chicken eggs.

	<ul style="list-style-type: none"> - Identification of the pathogenetic mechanisms by which viral and subviral agents cause diseases in animals, the effects that viruses induce by their replication in the host cell and the organism. - Presentation of the body's natural defenses, including aspects of immunoprophylaxis and control of viral diseases in animals. - Description and characterization of the main families of viruses that cause diseases in animals, including bacteriophages and prions.
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COURSE CONTENT

LECTURES	Number of hours
Topic 1. Elements of bacterial taxonomy and nomenclature.	1
Topic 2. Pathogenicity of bacteria. Host-bacteria relationship. Pathogenicity factors in bacteria.	2
Topic 3. Special bacteriology. Group of cocci. Gram-positive asporogenic acid-fast bacilli.	4
Topic 4. Group of Gram-positive sporogenic bacilli.	3
Topic 5. Facultatively aero-anaerobic Gram-negative bacteria. Aerobic Gram-negative bacteria.	4
Topic 6. Group of bacteria with particular structures. Group of spirochetes. Group of rickettsiae. Group of mycoplasmas.	1
Topic 7. Elements of general virology. General characteristics of viruses: biological forms of existence of viruses in nature. Morphochemical structure and organization of the virion: viral genome, capsid and pericapsid.	2
Topic 8. Bacteriophages. Morphochemical structure. Phage infectivity and the phenomenon of lysogeny.	1
Topic 9. Infectivity of zootropic viruses. Virus-cell relationships. Virus tropism. Cytopathic effects produced by viruses. The phenomenon of viral interference. Replication mechanisms of viral genomes.	2
Topic 10. Criteria of viral taxonomy. Characterization of the main groups of viruses.	1
Topic 11. Viruses with DNA genome. Fam. Adenoviridae. Fam. Parvoviridae. Fam. Papovaviridae. Fam. Poxviridae. Fam. Herpesviridae. Fam. Iridoviridae.	2
Topic 12. Viruses with RNA genome. Fam. Picornaviridae. Fam. Calciviridae. Fam. Flaviviridae. Fam. Togaviridae. Fam. Rhabdoviridae. Fam. Bunyaviridae. Fam. Orthomyxoviridae. Fam. Paramyxoviridae. Fam. Reoviridae. Fam. Retroviridae. Fam. Arenaviridae. Fam. Coronaviridae.	5
SEMINAR/LABORATORY	Number of hours
Topic 1. Genus Staphylococcus. Genus Micrococcus.	3
Topic 2. Genus Streptococcus. Genus Enterococcus	3
Topic 3. Genus Bacillus. Genus Paenibacillus.	3
Topic 4. Genus Listeria. Genus Erysipelothrix.	3
Topic 5. Genus Corynebacterium. Genus Lactobacillus.	3
Topic 6. Genus Clostridium (strictly toxigenic species).	3
Topic 7. Genus Clostridium (toxigenic and virulent species).	3
Topic 8. Genus Mycobacterium. Genus Actinomyces.	3
Topic 9. Genus Pseudomonas. Genus Burkholderia. Genus Alcaligenes. Genus Bordetella.	3
Topic 10. Lactose-positive Enterobacteriaceae: Genus Escherichia, Genus Citrobacter, Genus Klebsiella, Genus Enterobacter, Genus Erwinia, Genus Serratia.	3
Topic 11. Enterobacteriaceae lactose-negative genera: Genus Salmonella, Genus Shigella, Genus Hafnia, Genus Edwardsiella, Genus Proteus, Genus Providencia, Genus Morganella, Genus Yersinia.	3
Topic 12. Genus Pasteurella. Genus Haemophilus. Genus Actinobacillus.	3
Topic 13. Genus Dichelobacter. Genus Fusobacterium. Genus Vibrio. Genus Campylobacter.	3
Topic 14. Genus Leptospira. Genus Brucella. Genus Borrelia, Genus Treponema. Genus Spirochaeta. Genus Neisseria. Genus Moraxella. Genus Helicobacter. Genus Streptomyces.	3

BIBLIOGRAPHY:

- Iulia Maria BUCUR, Radu Valentin GROS - VETERINARY BACTERIOLOGY

ASSESSMENT

Activity type	Assessment criteria	Assessment methods	Percentage of final grade
Lectures	Communicating information using the scientific language of the Microbiology discipline correctly.	Oral exam with three subjects (pass condition – minimum grade 5 in the last two subjects)	60%
	Knowledge of the basic concepts of the discipline and their assimilation.		
	Originality and accuracy of answers in constructing arguments for/against.		
	Demonstration of coherent, logical thinking in the presentation of ideas and the ability to apply theoretical knowledge in solving practical problems.		
Seminar/laboratory/clinical sessions	Applying acquisitions in providing examples, in carrying out analyses, in solving exercises, problems, in supporting arguments, etc.	Periodic evaluation (through oral / written evaluation tests)	10 %
	Using the discipline's own acquisitions in the inter-, intra-, multi- and/or transdisciplinary approach to problem problems/situations.	Practical exam	30 %
Other activities	Attendance at class, attendance at practical work Promoting laboratory assessment		

Course coordinator: S. Lect. PhD Radu Valentin GROS

**Practical activities coordinator L/S/P: S. Lect. PhD Radu Valentin GROS,
S. Lect. PhD Iulia-Maria BUCUR**