

Study Programme: Veterinary medicine
Course Unit Title: Microbiology
Course Unit Code: 3IVM3O13
Name of Lecturer(s): Vesna Lalošević, Dragan Rogan
Type and Level of Studies: IAS
Course Status (compulsory/elective): compulsory
Semester (winter/summer): winter
Language of instruction: English
Mode of course unit delivery (face-to-face/distance learning): face to face
Number of ECTS Allocated: 6,5
Prerequisites: none
<p>Course Aims: Acquiring theoretical and practical knowledge and skills in the field of veterinary microbiology (general and special bacteriology, mycology and virology). The subject includes morphology, cultural traits, pathogenic significance and microbiological diagnosis of the most important genera and species of bacteria and fungi of importance for veterinary medicine as well as the structure, multiplication and proving of the virus as well as the consequences of viral infections by the organism of animals and birds.</p>
<p>Learning Outcomes: Acquired knowledge and skills enable more efficient identification of bacterial, fungal and viral infections. Also, the acquired knowledge allows for a better overview of materials from the subject of epidemiology and infectious diseases, and others dealing with the consolidation of the source of infection, occurrence, spread and eradication of bacterial, fungal and viral infections.</p>
<p>Syllabus: <i>Theory</i> History of microbiology, Morphology and structure of bacteria, metabolism, Genetics, Growth and reproduction, Antibiotics, Disinfection and sterilization, <i>G. Staphylococcus</i>, <i>G. Streptococcus</i>, <i>G. Enterococcus</i>, <i>G. Bacillus</i>, <i>G. Actinomyces</i>, <i>G. Corynebacterium</i>, <i>G. Nocardia</i>, <i>G. Rhodococcus</i>, <i>G. Listeria</i>, <i>G. Erisipelotrix</i>, <i>G. Mycobacterium</i>, <i>Enterobakterije</i>, <i>G. Salmonella</i>, <i>E. coli</i>, <i>G. Yersinia</i>, <i>uslovno patogene enterobakterije</i>, <i>G. Campylobacter</i>, <i>G. Helicobacter</i>, <i>G. Leptospira</i>, <i>G. Borrelia</i>, <i>G. Bordetella</i>, <i>G. Neisseria</i>, <i>G. Moraxella</i>, <i>G. Haemophilus</i>, <i>G. Actinobacillus</i>, <i>G. Pseudomonas</i>, <i>G. Aeromonas</i>, <i>Plesiomonas</i>, <i>Vibrio</i>, <i>G. Brucella</i>, <i>G. Pasteurella</i>, <i>G. Mannheimia</i>, <i>G. Francisella</i> <i>Анаеробне бактерије</i>, <i>G. Clostridium</i>, <i>G. Mycoplasma</i>, <i>G. Chlamidia</i>, <i>Veterinary important fungi</i>. Genetics and evolution of viruses, mutation, viral recombination, virus-host cell recombination, other interactions involving viruses. ,viral genomic sequence analyses. Nature, structure and taxonomy of viruses. Replication of viruses-stages in the replication of a herpesviruses, an enveloped, double-stranded DNA viruses. Stages in the replication of a Picornaviruses, a non-enveloped, positive-sense, single stranded RNA viruses. Stages in the replication of a Rhabdoviruses, an enveloped, negative sense ,single stranded RNA viruses. Stages in the replication of a retrovirus. LTRs: long terminal repeats. Virus protein synthesis. Assembly and release of virions. Propagation of viruses and virus-cell interactions. Pathogenesis of viral diseases, route of infection, dissemination in the host, haematogenous spread, neural spread. Clinical signs. Virus shedding and patterns of infection. Mechanisms of persistence. Antiviral chemotherapy. Resistance to antiviral drugs. Virus families-DNA viruses: <i>Herpesviridae</i>, <i>Papillomaviridae</i>, <i>Adenoviridae</i>, <i>Poxviridae</i>, <i>Asfaviridae</i>, <i>Parvoviridae</i>, <i>Circoviridae</i>, <i>Hepadnaviridae</i>, <i>Polyomaviridae</i>, RNA viruses: <i>Retroviridae</i>, <i>Reoviridae</i>, <i>Birnaviridae</i>, <i>Paramyxoviridae</i>, <i>Rhabdoviridae</i>, <i>Filoviridae</i>, <i>Bornaviridae</i>, <i>Orthomyxoviridae</i>, <i>Bunyaviridae</i>, <i>Arenaviridae</i>, <i>Coronaviridae</i>, <i>Arteriviridae</i>, <i>Picornaviridae</i>, <i>Calciviridae</i>, <i>Astroviridae</i>, <i>Flaviviridae</i>, <i>Togaviridae</i>. (Unsigned DNA i RNA viruses). Prions</p> <p><i>Practice</i> Microscopic examination of bacteria, staining, cultivation, Biochemical and physiological tests, susceptibility testing on antimicrobial agents, Laboratory proofing: <i>G. Staphylococcus</i>, <i>G. Streptococcus</i>, <i>G. Bacillus</i>, <i>G. Mycobacterium</i>, <i>Enterobacteriaceae</i>, <i>E. coli</i>, <i>G. Clostridium</i>, Isolation and identification of fungi. Laboratory diagnosis of viral infections. Propagation of viruses-tissue culture, detection of viral growth in cell culture, embryonated eggs, experimental animals, determination of virus concentration, collection preservation and transportation of samples. Detection of virus, viral antigens and nucleic acid. Isolation of viruses. Electron microscopy. Immunofluorescence and Immunohistochemistry. Solid-immunoassay. Immunodiffusion. Complement fixation test for antigen detection. Nucleic acid detection. Diagnostic</p>

serology. Enzyme-Linked immunosorbent assay (ELISA).Immunoflorescence for antibody detection. Serum neutralization test. Haemagglutination inhibition test. Complement fixation test. Western blotting (immunoblotting) technique. Interpretation of results. PCR methods for amplification, quantitation, *in situ* hybridization, and multiplex reactions. Important virus detection methods such as *in situ* hybridization; Southern, dot, and slot blots; branched chain signal amplification; and chemiluminescence. Quality control methods that are crucial in research and clinical laboratories

Required Reading:

1. Veterinary microbiology. – 3rd ed. / editors, D.S. McVey, Melissa Kennedy, M.M. Chengappa,2013.

Weekly Contact Hours:4+3

Lectures:4

Practical work:3

Teaching Methods:

Lectures – oral, textual and illustrative / demonstrative methods.

Practical classes - management of students individual work and demonstrative / illustrative methods

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation	5	written exam	30
Practical work	5	oral exam	60
Preliminary exam(s)		
Seminar(s)			

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.