



СИЛАБУС ДИСЦИПЛІНИ « VETERINARY MICROBIOLOGY »

Ступінь вищої освіти - Магістр
Спеціальність 211 Ветеринарна медицина
Освітня програма «Ветеринарна медицина»
Рік навчання 2, семестр 3
Форма здобуття вищої освіти денна
Кількість кредитів ЄКТС 6
Мова викладання англійська

Лектор дисципліни

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URL ЕНК на
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НУБіП України

<https://elearn.nubip.edu.ua/course/view.php?id=1151>

ОПИС ДИСЦИПЛІНИ

The purpose of the discipline "Veterinary Microbiology" is to form a future specialist in veterinary medicine knowledge and skills related to microorganisms, including biology and ecology of microorganisms, bacterial pathogens of animal diseases and diseases of food origin, principles and methods of laboratory diagnosis of infectious animal diseases.

This course includes: An Introduction to the study of bacteria, viruses, fungi, and protozoa. Topics include History of Microbiology, Prokaryotic and Eukaryotic cells, Classification, Microscopy, Staining techniques, and Microbial growth and nutrition. Materials will include PowerPoint presentations, links to videos, lecture notes at the eLearn. The course will take a 1 semester to complete. The course will be structured in such a way that there will be a progression from one concept to the next, although each lesson will be a stand-alone. It will include laboratory aspects associated with Microbiology.

Acquisition of competencies

Integral competence (IC): the ability to solve complex tasks and problems in veterinary microbiology, which involves conducting research and/or innovation and is characterized by the uncertainty of conditions and requirements.

General competencies (GC):

- ✓ ability to abstract thinking, analysis and synthesis;
- ✓ ability to apply knowledge in practical situations;
- ✓ ability to conduct research at the appropriate level;
- ✓ knowledge and understanding of veterinary microbiology;
- ✓ ability to make informed decisions;
- ✓ desire to preserve the environment.

Professional (special) competencies (PC):

- ✓ ability to follow the rules of labor protection, asepsis and antiseptics during professional activities;
- ✓ ability to carry out procedures for selection, packaging, preservation and transfer of samples of biological material for microbiological research;
- ✓ ability to organize, conduct and analyze the results of microbiological research;
- ✓ ability to protect the environment from pollution during microbiological research.

Program learning outcomes (PL):

- ✓ Know and correctly use microbiological terminology.
 - ✓ Use information from domestic and foreign sources to develop strategies in microbiological diagnostics.
 - ✓ Develop measures aimed at protecting the population from bacterial diseases common to animals and humans.
 - ✓ Understand the logical sequence of actions and be able to draw up appropriate documentation during microbiological research.
 - ✓ Know the rules and requirements of biosafety, bioethics and animal welfare.
- To have specialized software tools for performing professional tasks.

СТРУКТУРА НАВЧАЛЬНОЇ ДИСЦИПЛІНИ

| Теми | Години (лекції/ лабораторні/ самостійні) | Результати навчання | Завдання | Оцінювання |
|----------------------------------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------|-------------------|
| 3 семестр | | | | |
| Module 1. | | | | |
| Theme 1. Introductory lecture. Subject and problems of microbiology. | 2/4/6 | Must know: the subject and objectives of microbiology; history of microbiology as a science. Must be able to: use a light microscope; prepare bacterial preparations for microscopy using simple staining methods. | Pass the laboratory work. Perform independent work (including on eLearn). | 70 |
| Theme 2. Morphology and systematics of microorganisms. | 2/4/6 | Must know: taxonomy, morphology of bacteria, chlamydia, mycoplasmas, rickettsia. Must be able to: use complex staining methods to study the morphology of microorganisms and their differentiation; to study bacteria in a living state. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Theme 3. Morphology of microscopic fungi and basics of their taxonomy. | 2/4/6 | Must know: the structure of the mycelial body of microscopic fungi; features of morphology of phyco- and mycomycetes. Methods of reproduction of fungi; pathogens of mycoses and mycotoxicosis. Must be able to own the technique of mycological research. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Module 1. | 1 | | Testing (including on eLearn). | 30 |
| Total 1. | 49 | | | 100 |
| Module 2. | | | | |
| Theme 4. Physiology of microorganisms | 2/4/6 | Must know: the chemical composition of microorganisms, the mechanism of their nutrition, reproduction and | Pass the laboratory work. | |

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| | | respiration; the role of microbial enzymes. Must be able to prepare / sterilize utensils, tools, nutrient media for bacteriological research. | Perform independent work (including on eLearn). | |
| Theme 5. Genetics of microorganisms | 2/4/6 | Must know: about the organization of genetic material in bacteria; forms of variability; genetic recombination. Must be able to have the technique of bacteriological research, to allocate a "pure culture" of bacteria. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Theme 6. Ecology of microorganisms. | 2/4/6 | Must know: the microflora of water, air, soil, animal body, man; types of relationships of bacteria with other organisms. Must be able to take samples of water, soil and air and carry out their bacteriological examination; determine the sensitivity of bacteria to antibiotics. Analyze the results of the sanitary-microbiological assessment of objects. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Theme 7. The doctrine of infection and immunity | 2/4/6 | Must know: types of infection, stages of the infectious process, factors of pathogenicity of microorganisms, mechanisms of infection transmission; types of immunity, forms of immunity. Must be able to identify bacteria by phenotypic characteristics and determine their pathogenicity. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Module 2. | 2 | | Testing (including on eLearn). | |
| Total 2. | 56 | | | 100 |
| Module 3. | | | | |
| Theme 8. The causative agent of anthrax. Pathogenic cocci. | 2/4/6 | Must know: biological characteristics of the anthrax pathogen, immunity, means of specific prevention and therapy of anthrax; modern methods of lab. diagnostics. Must be able to take samples of material for backscatter; detect and identify pathogens. Analyze the results of bacteriological studies. | Pass the laboratory work. Perform independent work (including on eLearn). | |

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| Theme 9. Pathogens of anaerobic infections. | 2/4/6 | Must know: Biological properties of pathogens blackleg, anaerobic infections of sheep, malignant edema, tetanus, botulism, necrobacteriosis. Laboratory diagnosis of diseases, means of prevention. Must be able to take samples of material for backscatter; detect and identify pathogens. Analyze the results of bacteriological studies. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Theme 10. Pathogenic enterobacteria. | 2/4/6 | Must know: biological characteristics of salmonella, Escherichia, etc. species of enterobacteria, modern methods of laboratory diagnosis of these diseases. Must be able to take samples of material for backscatter; detect and identify pathogens. Analyze the results of bacteriological studies. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Theme 11. Brucella and the causative agent of tularemia | 2/4/6 | Must know: the characteristics of the causative agent of brucellosis, the peculiarities of immunity; bacteriological, serological and allergic diagnosis of brucellosis. Possibilities of specific prevention of infection. Must be able to take samples of material for backscatter; detect and identify the pathogen. Analyze the results of bacteriological studies. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Module 3. | 2 | | Testing (including on eLearn). | 30 |
| Total 3. | 36 | | | 100 |
| Module 4. | | | | |
| Theme 12. The causative agent of tuberculosis | 2/4/6 | Must know: the characteristics of Mycobacterium tuberculosis, their types, the possibility of differentiation; bacteriological, serological and allergic diagnosis of the disease, features of immunity, biological products. Must be able to take samples of material for backscatter; detect and identify the pathogen. Analyze the results of bacteriological studies. | Pass the laboratory work. Perform independent work (including on eLearn). | |

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| Theme 13. The causative agent of erysipelas, listeriosis, pasterellosis. | 2/4/6 | Must know: biological characteristics of the causative agent of erysipelas, listeriosis, pasterellosis; modern methods of laboratory diagnosis of these diseases. Must be able to take samples of material for backscatter; detect and identify pathogens. Analyze the results of bacteriological studies. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Theme 14. Pathogenic Leptospira. | 2/4/6 | Must know: the characteristics of pathogenic Leptospira; bacteriological, serological diagnosis of the disease, features of immunity, biological products. Must be able to take samples of material for backscatter; detect and identify the pathogen. Analyze the results of bacteriological studies. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Theme 15. Pathogenic mycoplasmas. Chlamydia and rickettsia. | 2/4/6 | Must know: the difference between mycoplasmas and other bacteria; features of mycoplasma cultivation, their identification, laboratory diagnosis of mycoplasmosis, possibilities of their prevention, characteristics of chlamydia and rickettsia, features of cultivation, means of prevention and therapy. Must be able to take samples of material for backscatter; detect and identify the pathogen. Analyze the results of bacteriological studies. | Pass the laboratory work. Perform independent work (including on eLearn). | |
| Module 4. | 2 | | Testing (including on eLearn). | |
| Total 4. | 39 | | | 100 |
| Всього за 3 семестр/навчальна робота | | | | 70 |
| Екзамен | | | | 30 |
| Всього за курс | | | | 100 |

ПОЛІТИКА ОЦІНЮВАННЯ

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| Політика щодо дедлайнів та перескладання: | Роботи, які здаються із порушенням термінів без поважних причин, оцінюються на нижчу оцінку. Перескладання модулів відбувається із дозволу лектора за наявності поважних причин (наприклад, лікарняний). |
| Політика щодо академічної доброчесності: | Списування під час модульних робіт та екзаменів заборонені (у т.ч. із використанням мобільних девайсів). |
| Політика щодо відвідування: | Відвідування занять є обов'язковим. За об'єктивних причин (наприклад, хвороба, міжнародне стажування) навчання може |

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| | відбуватись індивідуально (в онлайн формі за погодженням із деканом факультету). |
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ШКАЛА ОЦІНЮВАННЯ ЗНАНЬ ЗДОБУВАЧІВ ВИЩОЇ ОСВІТИ

| Рейтинг студента, бали | Оцінка національна за результати складання екзаменів заліків | |
|------------------------|--------------------------------------------------------------|---------------|
| | екзаменів | заліків |
| 90-100 | відмінно | зараховано |
| 74-89 | добре | |
| 60-73 | задовільно | |
| 0-59 | незадовільно | не зараховано |

РЕКОМЕНДОВАНІ ДЖЕРЕЛА ІНФОРМАЦІЇ

1. Veterinary Microbiology: textbook / G. V. Kozlovska, M. V. Melnyk. – Kyiv: PC “Komprint”, 2023 – 252 p.
2. Veterinary Microbiology / D. Scott McVey, Melissa Kennedy, M.M. Chengappa / Wiley-Blackwell; 3rd Edition, 2013. 648 p.
3. Clinical Veterinary Microbiology / Bryan Markey, Finola Leonard, Marie Archambault, Ann Cullinane / Wiley-Blackwell; 2 edition, 2011. 928 p.
4. Ветеринарна мікробіологія: підручник / В. Г. Скибіцький, В. В. Власенко, Г. В. Козловська та ін.; за ред. В. Г. Скибіцького, В. В. Власенка. - 2-ге вид., змінене і доп. Київ: ЦП «Компринт», 2016. 420 с.