Thematic plan of seminar-type classes
in discipline « Microbiology »
for students of 2025 year of admission
under the educational programme
33.05.01 Pharmacy,
specialisation (profile) Pharmacy
(Specialist's degree),
form of study full-time
for the 2025-2026 academic year

№	Thematic blocks	Hours (academic) [3]
	2 semester	
1.	Microbiological laboratories, their equipment.[1] Safety rules for working with gas, living microorganisms. Morphology of bacteria. Microscopic method of investigation. Simple methods of staining.[2]	4
2.	Ultrastructure and chemical composition of the bacterial cell.[1] Obligate and non-obligate/non-persistent structures of microbial cell, their role and methods of study. Complex methods of staining.[2]	4
3.	Physiology of microorganisms.[1] Nutrition and respiration of bacteria. Culture media. Bacterial growth and multiplication. Bacteriological method of investigation, its stages. Cultural properties of microbes.[2]	4
4.	Physiology of microorganisms.[1] Methods of cultivation and isolation of pure cultures of aerobes and anaerobes. Bacterial enzymes, classifications. Biochemical activity of bacteria and methods of biochemical identification of microorganisms. [2]	4
5.	Morphology and physiology of actinomycetes, spirochetes, rickettsia, mycoplasmas and chlamydia. [1] Methods of their study. [2].	4
6.	Morphology and physiology of fungi and viruses. [1] Classifications, general characteristics of fungi and viruses, methods of their study. Methods of cultivation of viruses and viral detection.[2]	4
7.	**Concluding session.**	4
8.	Genetics of microorganisms.[1] Organization of genetic material in bacteria. Mutations in bacteria. Transduction, transformation and conjugation. Plasmids, their types and meaning. Genetic engineering. Molecular genetic methods for diagnosing of infectious diseases. [2]	4
9.	Sanitary microbiology.[1] Bacteriology of water, air and soil. Sanitary-indicative microorganisms. Methods of their detection. Normal microbiota of the human body, its importance. Dysbacteriosis, conditions and stages of its development, prevention.[2]	4
10.	Microflora of medicinal plants, plant raw materials and medical forms.[1] Phytopathogenic microorganisms. Methods for detection of microbial contamination of pharmacy rooms.[2]	4

11.	Influence of environmental factors on microorganisms.[1] Physical and chemical factors. Sterilization and disinfection. Asepsis and antiseptics. Methods of sterilization and disinfection used in pharmaceutical practice. [2]	4
12.	The effect of biological factors on microorganisms.[1] Chemotherapeutic agents, mechanisms of their action. Antibiotics: classification, mechanism of action. Determination of bacterial sensitivity to antibiotics. Bacteriophages, bacteriocins, phytoncides. [2]	4
13.	**Concluding session.**	4
14.	Infection: types of infection, stages, the conditions for the development of the infectious process. [1] Pathogenicity and virulence of microorganisms. Characteristics of bacterial toxins. Methods for detection of microbial toxins and aggressive enzymes. Biological method of study: its tasks, stages, significance. [2]	4
15.	Immunity.[1] Types of immunity. Innate immunity. Factors and mechanisms of nonspecific resistance: anatomic barriers, humoral and cell factors of non-specific immunity, phagocytosis. [2]	4
16.	Acquired immunity.[1] Cell-mediated and humoral immunity. T- and B- lymphocytes. Antibodies, classification. Antigens of bacteria and viruses. Serological method of study. Seroidentification and serodiagnosis.[2]	4
17.	Immunotherapy and immunoprophylaxis.[1] Vaccines, Sera, Immunoglobulins, Toxoids, their classification and practical application.[2]	4
18.	**Concluding session.**	4
	Total	72

[1] – topic
[2] – essential content
[3] – one thematic block includes several classes, the duration of one class is 45 minutes, with a break between classes of at least 5 minutes

Considered at the Microbiology department meeting, protocol of «11» June 2025 г. № 12.

Head of the Department  Professor Stepanenko I.S.