

**Thematic lesson plan of the lecture type  
in the discipline " Pharmaceutical ecology"  
for students in basic vocational education  
specialist 's program  
specialty 33.05.01 Pharmacy,  
focus (profile) Pharmacy,  
Full-time form of education  
for 2023-2024 academic year**

No.	Lecture-type topics	Hours (academic)	
		VII sem.	VIII sem.
1.	Pharmaceutical ecology as a science and its connection with general ecology. <sup>1</sup> Subject and content of ecology, pharmaceutical ecology, nature protection. History of formation and development. Modern problems of ecology. Environmental problems specific to the Volgograd region. The value of environmental education and education in the work of a pharmacist. <sup>2</sup>	2	
2.	Habitat. Environmental factors, classification. Adaptation of the body to environmental factors. Basic laws and rules of adaptation. The main mechanisms for the formation of adaptations at the level of the body. <sup>1</sup> Types of environmental factors. Patterns of the impact of environmental factors on the body: the rule of optimum; minimum rule; Shelford's tolerance rule; rule of two levels of adaptation; the ambiguity of the effect of the factor on various functions of the body; rule of interaction of factors; the law of ecological duplication. The main mechanisms of formation of adaptations at the level of the body. Features of adaptation of organisms to different environments of life. <sup>2</sup>	2	
3.	The doctrine of the biosphere: the biosphere as a global earth ecosystem. <sup>1</sup> The biosphere as a global ecosystem of the earth. The cycle of matter in nature. natural ecosystems. Works by V.I. Vernadsky. The concept of the noosphere. Causes of the ecological crisis at the present stage. <sup>2</sup>	2	
4.	Population and interaction of populations. <sup>1</sup> Population definition. Population as a biological system. Population structure of the species. population boundaries. Distribution as a function of the species. Interpopulation connections. Ecological characteristics of populations. Quantitative indicators and population structure (number, density, birth rate, mortality, growth, growth rates. Variety of types of population dynamics. Dynamics of quantitative indicators. Types of population structures. Spatial structure of populations. Types of spatial distribution in plants and animals. Factors that determine the spatial structure of a population : biological properties of the species and features of the environment Forms of group associations of animals and plants <sup>2</sup>	2	
5.	Biotic communities: concept. Species structure of biocenosis. Spatial structure of biocenosis. ecological niche. Interaction of organisms in the biocenosis. <sup>1</sup> Biotic communities: patterns of biodiversity change, the concept of a dominant species. Spatial structures of biocenosis: vertical and horizontal structures. Interaction of organisms in the biocenosis. Trophic structure of biocenosis. <sup>2</sup>	2	
6.	Environmental factors and public health. <sup>1</sup> Living conditions in modern cities. Quantitative Methods for Assessing and Managing Health Risks. Carcinogenic and non-carcinogenic risks: concepts, assessment methods. <sup>2</sup>	2	
7.	Food ecology; xenobiotics in food. Nutritional supplements. Biologically active food supplements. <sup>1</sup> Food quality and safety. Xenobiotics in food; classification of xenobiotics supplied by the alimentary route. Food additives: definition, classification, modern approaches to regulation. Biologically active food supplements: concept, main classifications, regulatory documents, turnover regulation. <sup>2</sup>	2	
8.	The main types of anthropogenic impacts on the atmosphere, hydrosphere and lithosphere and biotic communities. <sup>1</sup> The main air pollutants. Stages, main directions of anthropogenic impacts on the biosphere. General environmental problems of the Russian Federation and the specifics of the city of Volgograd and the city of Volzhsky, Volgograd region. Ecological crises and ecological revolutions: causes and consequences. Natural disasters and man-made accidents. Monitoring the quality of biosphere systems. Directions for the protection of atmospheric air. <sup>2</sup>		2

9.	Chemical and pharmaceutical enterprises as sources of environmental pollution. Environmental problems of labor in pharmaceutical enterprises. <sup>1</sup> Characteristics of the main industrial poisons of the chemical and pharmaceutical industry. Harmful effects of chemicals on pharmaceutical workers. enterprises. Prevention of the harmful effects of chemicals. Ecological characteristics of the main technological processes of the chemical and pharmaceutical industry. Environmental problems in the production of drugs. Environmental control in production. <sup>2</sup>		2
10.	Pollution of the environment with metals, nitrogen compounds, pesticides, radionuclides. <sup>1</sup> The main sources of metal pollution of the hydrosphere, atmosphere, lithosphere. Classification of metals according to biological effects on the body. Mechanism of toxicity. Environmental pollution with superecotoxicants - cadmium, mercury, lead. accumulation in the food chain. Methods for the analysis of metals. Pollution of the environment with pesticides, consequences. Methods for the analysis of pesticides. Pollution of the environment with nitrogen compounds. Sources of pollution. Nitrogen oxides, nitrates, nitrites, nitrosamines. Their transformations and accumulation in the environment. Effects on humans and the environment. The formation of nitrosamines in the human body. Methods for the analysis of nitrogen compounds. Environmental pollution with radionuclides. Sources of radioactive contamination - natural and anthropogenic. Radioactive contamination of the surface layer of the atmosphere, soil and water systems. doses of radiation. Units of measurement of radioactivity. Impact on the environment and the human body. Migration of radionuclides through food chains. Radioactive waste and its disposal. <sup>2</sup>		2
11.	Natural environment, natural conditions and natural resources. Essence and main types of nature management. <sup>1</sup> Nature. Elements of nature: natural conditions and natural resources. The role of external and internal factors in determining the characteristics of natural conditions. Natural resources: concept, characteristics, classification. Natural resources of the Volgograd region. Features of the interaction between society and nature at the present stage. The concept, types and forms of nature management. Principles of rational nature management. <sup>2</sup>		2
12.	Organizational and legal bases of environmental protection and rational use of natural resources. Environmental protection measures, the role of technological progress in protecting the environment. Ecological problems of the use of plant and animal resources and their consequences. <sup>1</sup> Ecological resources of medicinal plants of the northwestern Caspian region (on the model of the Volgograd region). Protection of plant resources. Characteristics of the current state of the animal world. Importance of animals in human life. Principles of rational use of flora and fauna resources. Protection of rare and endangered plants On the model of the Volgograd region. Measures for the protection of wildlife. <sup>2</sup>		2
Total		14	10
		24	

<sup>1</sup> - topic

<sup>2</sup> - essential content

Considered at the meeting of the department of General hygiene and ecology IPH may, 24, 2023, protocol No 9.

Head of the Department



N.I. Latyshevskaya