

Annotation of the selective educational component

Academic discipline	Aquatic toxicology
Lecturer	Petro Vered Candidate of Agricultural Sciences, Associate Professor Department of Ecology and Biotechnology
The course and semester, when the discipline is planning to study	2 nd course, 4 th semester
Faculties whose students are invited to study discipline	Faculty of Ecology
List of competencies and learning-related outcomes that discipline provides	<p>According to the requirements of the educational and professional program "Aquatic bioresources and aquaculture", students must acquire the ability to acquire the following competencies:</p> <ul style="list-style-type: none"> – GC (general competence) 8. Knowledge and understanding of the subject area, and understanding of professional activities. – GC 12. Ability to conduct research at the level. – SC (special competence) 2. Ability to investigate biochemical, hydrobiological, hydrochemical, genetic, and other changes in aquatic biological resources and aquaculture and habitats. – SC 7. The ability to influence the hydrochemical and hydrobiological parameters of the aquatic environment on the physiological state of aquatic living organisms. – SC 8. The ability to perform ichthyopathological, hydrochemical, and hydrobiological studies in order to diagnose fish diseases, assess their course, and the effectiveness of treatment and prevention. <p>The result of training in the discipline is the acquisition by students of such knowledge and skills:</p> <ul style="list-style-type: none"> - To apply knowledge and understanding of the chemical composition of natural waters, the temperature regime of water bodies, BEP, pH, TDS of water, the content of toxic substances, the use of natural waters, and the processes of self-purification of water bodies when growing objects of aquatic biological resources and aquaculture. - Know and understand the factors influencing the toxic effect (temperature, pressure, vibration, noise, ionizing radiation). - Apply the skills of performing experimental studies to identify sources of pollution in aquatic ecosystems. - Know and use bioindicative methods to determine the toxicity of water and coastal soils. - To know the main historical stages of the formation and development of aquatotoxicology. - Understand the meaning, place, and perspectives of aquatic

	<p>toxicology.</p> <ul style="list-style-type: none"> - Understand the process of approximation of Ukrainian legislation in the EU Water Rights. - Analyze and apply the results of studies of specific characteristics of sensitivity and resistance of fish to toxicants. - Know the ways in which toxic substances enter the aquatic environment; the distribution, migration, and transformation of toxicants in the aquatic environment, and the consequences of this.
Description of the discipline	
Preconditions necessary for the study of the discipline	The academic discipline "Aquatic toxicology" is based on the knowledge of such disciplines as "Introduction to the profession", "Hydrochemistry", "Hydroecology", and "Physiology and biochemistry of aquatic organisms", studied in the 1st and 2nd courses.
The maximum number of students who can study simultaneously	<p>Lectures - 50 students</p> <p>Practical - 25 students</p>
Lesson plans	<p>Lectures</p> <ol style="list-style-type: none"> 1. Subject of water toxicology. Academic virtue. 2. main concepts and terminology of aquatoxicology. Sources of water pollution. Toxicants. The concentration of toxic substances. Maximum Permissible Concentration (COD). Fisheries COD. Chronic, acute toxicity. Methods for diagnosing poisoning of hydrobionts. Scheme of the study of reservoirs. Organoleptic characteristics of the properties of water. 3. Major groups of potentially toxic pollutants. The main groups of toxicants and their features. The danger of pollution of water areas. 4. Determination of the toxicity of the aquatic environment. Significance of water toxicology control. Specific features of fish sensitivity and resistance to toxicants. Toxin resistance. Sensitivity to toxicants of different fish species. 5. Biotesting and bioindication as methods for controlling water toxicity. The test object, test function, test reaction, and test system. 6. Ways of entry of toxic substances into the aquatic environment. Distribution, migration, and transformation of toxicants in the aquatic environment and its consequences. Self-pollution and self-purification of water bodies. 7. Factors affecting the toxic effect (temperature, pressure, vibration, noise, ionizing radiation, etc.). 8. EU Waste Water Directive. 9. Water Framework Directive. 10. Maritime Strategy Directive. 11. Nitrate directive. <p>Practical classes</p>

<p>Teaching language</p>	<ol style="list-style-type: none"> 1. Safety briefing 2. Methods for diagnosing fish poisoning in water bodies. 3. Scheme of studies of water bodies in case of fish poisoning. 4. Taking, preserving, packing, and sending material for research. 5. Fish sample. 6. Clinical and pathoanatomical studies of sick and dead fish and postmortem section of fish. 7. study of the ORP of water. 8. Physical characteristics of water properties: temperature, transparency, turbidity, color. 9. Determination of the pH of water. 10. Determination of the total mineralization of water. 11. Determination of ambient indicators β and γ of radiation safety of aquatic products. 12. Determination of the fluctuating asymmetry of fish. 13. Determination of the fluctuating asymmetry of amphibians. 14. Growth test. 14. Final lesson. <p>Ukrainian</p>
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