

## Discription of Discipline

Title of Discipline / <b>Ecology</b>				
Semester	Duration	Type of Discipline	ECTS Credits	Student Workload
6	120	elective	4	30 hours of teaching, 90 hours of self-study

Requirements for Participation	Type of examination (oral, written, term paper, etc.)	Methods of teaching and learning (lectures, seminars, etc.)	Discipline Coordinator
Completed disciplines 'Political Economy', 'Fundamentals of Systems Theory', 'Microeconomics', 'Macroeconomics'; complete general secondary education	Written exam	Lectures, practical classes	O. Minina

Learning Outcomes
<p>GC2. Ability to preserve moral, cultural, scientific values and increase the achievements of society based on understanding the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology, use different types and forms of physical activity rest and lead a healthy lifestyle.</p> <p>GC4. Ability to apply knowledge in practical situations.</p> <p>GC5. Ability to communicate in the state language both orally and in writing.</p> <p>GC7. Skills in the use of information and communication technologies.</p> <p>GC8. Ability to search, process and analyze information from various sources.</p> <p>GC11. Ability to make informed decisions.</p> <p>GC13. The ability to act socially responsibly and consciously.</p> <p>GC14. Knowledge of current issues and the main tasks of life safety and the ability to determine the scope of their responsibilities for the performance of professional tasks, taking into account the risk of hazards that can cause emergencies and lead to adverse consequences on the premises.</p> <p>GC15. Ability to provide assistance and advice to employees and the public on practical issues of life safety and protection in emergencies.</p> <p>SC7. Ability to use computer technology and data processing software to solve economic problems, analyze information and prepare analytical reports.</p> <p>SC10. Ability to use modern sources of economic, social, managerial, accounting information for the preparation of official documents and analytical reports.</p> <p>SC14. Ability to analyze in depth problems and phenomena in one or more professional areas, taking into account economic risks and possible socio-economic consequences.</p> <p>SC34. Ability to navigate the basic methods and systems of man-made safety, reasonably choose known devices, systems and methods of protection of man and the environment from hazards.</p>

PLO5. Apply analytical and methodological tools to substantiate proposals and make management decisions by various economic agents (individuals, households, enterprises and public authorities).

PLO6. Use professional reasoning to convey information, ideas, problems and ways to solve them to professionals and non-specialists in the field of economic activity.

PLO10. Apply the acquired theoretical knowledge to solve practical problems and meaningfully interpret the results.

PLO11. Identify sources and understand the methodology for determining and methods of obtaining socio-economic data, collect and analyze the necessary information, calculate economic and social indicators.

PLO12. Be able to use data, provide arguments, critically evaluate logic and draw conclusions from scientific and analytical texts on economics.

PLO13. Perform interdisciplinary analysis of socio-economic phenomena and problems in one or more professional areas, taking into account the risks and possible socio-economic consequences.

PLO14. Use regulations and legal acts governing professional activities.

PLO15. Use information and communication technologies to solve socio-economic problems, prepare and present analytical reports.

PLO16. Be able to think abstractly, apply analysis and synthesis to identify key characteristics of economic systems at different levels, as well as the behavior of their subjects.

PLO17. Demonstrate flexibility and adaptability in new situations, in working with new objects, and in uncertain conditions.

PLO19. Be able to independently identify economic problems in the analysis of specific situations, to suggest ways to solve them.

PLO20. To form and evaluate indicators of efficiency of activity of the enterprises and establishments taking into account factors of external and internal environment.

PLO23. Assess possible risks, socio-economic consequences of management decisions.

PLO24. Have knowledge of ensuring safe working conditions and the environment when conducting research in production activities.

PLO25. Select and use the necessary scientific, methodological and analytical tools to manage economic activity.

PLO28. Ability to provide assistance and advice to employees and the public on practical issues of life safety and protection in emergencies.

## Contents

### **MODULE 1. ECOSYSTEM LEVEL OF ORGANIZATION OF MATTER AND ANTHROPOGENIC IMPACT ON THE ENVIRONMENT**

#### **Topic 1. The subject, methods and tasks of Ecology**

Ecology as a science, its structure and role in modern society. The concept of ecology, its subject, object and task. Historical development of human relations with nature.

Major tasks of Ecology.

#### **Topic 2. Ecosystem level of organization of matter**

The essence of environment. The definition of environment. Types of environment. Ecological factors of environment. General patterns and its impact on living organisms. Limiting factors. The essence of population. Statistics and dynamics of population. Dynamics of the population level. The concept of ecosystems, classification

of ecosystems. Ecosystems development. The main environmental components of ecosystems. Ecological pyramid. Food chain and its variants. Food web. Basic environmental laws.

**Topic 3. Biosphere as a global ecosystem of Earth. Global environmental issues**

Biosphere. Biosphere borders. Atmosphere, lithosphere, hydrosphere as constituents of biosphere. General properties of the biosphere. The place of ecosystems in the organization of the biosphere. Biogenic chemical elements. Dynamics and evolution of the biosphere. Global environmental issues. Environmental pollution. The problem of modern climate change. Depletion of the ozone layer in the stratosphere. Acidification of the environment. Waste management.

**Topic 4. Anthropogenic impact on the environment**

Environmental pollution. Sources, types and extent of environmental pollution. Behavior of pollutants in the environment. The most common pollutants. Global impact of anthropogenic pollution on the biosphere and individual ecosystems. Water, air and soil pollution. The impact of different industries on the environment.

**MODULE 2. ENVIRONMENTAL PROTECTION AND RATIONAL ENVIRONMENTAL MANAGEMENT**

**Topic 5. Economic mechanisms of environmental protection and rational environmental management**

Natural resources. Classification of natural resources. International natural resources. Principles of rational environmental management. Modern environmental requirements for human activity. Rational environmental management. Waste classification. Problems of waste disposal in different spheres of human activity. Zero waste technologies. Zero waste consumption. Methods of environmental management. Economic encouragement of environmental activity to business entities. Approval and licensing of environmental rights. Environmental insurance. Environmental funds.

**Topic 6. Monitoring of the environment. Environmental quality control in Ukraine**

Environmental quality control and management. Criteria for assessing the quality of the environment. Environmental quality standards. Environmental monitoring. Tasks of environmental monitoring. Emissions control for industrial enterprises and other businesses. Ecological examination of business entities. Legislation in the field of environmental protection. Legislation in the field of conservation. Environmental law. Environmental offenses. Types of liability for environmental offenses.

**Topic 7. Environmental management and marketing**

Environmental management. Formation of mechanisms of environmental management in the market economy. Environmental management at enterprises. Environmental marketing. Environmental audit.

**Topic 8. Environmental safety and environmental risks**

Environmental safety. Components of environmental safety. Types, sources and consequences of environmental hazards. Ecological crises, ecological situations. Anthropogenic factors of negative ecological situations. Environmental emergencies. Risk assessment and management.

**Topic 9. World environmental policy. International integration in the field of ecology**

International cooperation in the field of ecology. The United Nations Conference on Environment and Development (1992). The Kyoto Protocol. Stockholm Convention on Persistent Organic Pollutants. International environmental law.

### Exemplary Literature

1. Bilyavsky G.O. Fundamentals of ecology: theory and practice / G.O. Bilyavsky, L.I. Butchenko - K.: Libra, 2004. - 368 p.
2. Kovalenko G.D. Fundamentals of ecology: textbook / G.D. Kovalenko, G.S. Popenko. - H.: Publ. KhNEU, 2006. - 228 p.
3. Kovalenko G.D. Fundamentals of ecology: manual / G.D. Kovalenko, G.S. Popenko. - H.: ID "INZHEK", 2009. - 280 p.
4. Kolesnikov S.I. Ecological bases of nature management. - M.: Dashkov and Co.; Academcenter, 2012. - 304 p.
5. Mirkin B.M. A short course in general ecology. Part 1 and 2 / B.M. Mirkin, L.G. Naumova. - Ufa: BGPU, 2011. Part 1. - 206 p., Part 2. - 180 p.
6. Sukharev S.M. Fundamentals of ecology and environmental protection / S.M. Sukharev, S.Yu. Chudak, O.Yu. Sukhareva. - Kyiv: Center for Educational Literature, 2006. - 394 p.
7. Shevchuk V.Ya. Ecological management / V.Ya. Shevchuk, Yu.M. Satalkin, G.O. Bilyavsky. - K.: Lybid, 2004. - 432 p.

### Academic staff

Name	Academic degree	Position	Qualification / Academic Discipline	Full-time / Part-time	Area of Teaching
Minina Oksana Valeriivna	PhD in Economics	Associate Professor at the Department of Theoretical and Applied Economics	Chernihiv National University of Technology (1997), specialty – Management in the Production Sphere, qualification – Manager; Chernihiv National University of Technology (2017), specialty – Environmental and Natural Resource Economics, qualification – Master in Environmental and Natural Resource Economics; PhD in Economics, 08.00.05 Development of Productive Forces and Regional Economics	Part-time	Microeconomics, Internal Economic Mechanism of the Enterprise, Enterprise Strategy, Pricing, Ecological Economics, Ecology, Controlling