



**Environmental Protection Organization and Management**  
**Educational component work program (Syllabus)**

**Educational component details**

<b>Level of higher education</b>	<i>First (bachelor's)</i>
<b>Discipline</b>	<i>10 Natural Sciences</i>
<b>Specialty</b>	<i>101 Ecology</i>
<b>Educational program</b>	<i>OPP Environmental Safety</i>
<b>Status of the educational component</b>	<i>Regulatory</i>
<b>Form of study</b>	<i>full-time/distance/mixed</i>
<b>Year of training, semester</b>	<i>2nd year, spring semester</i>
<b>The scope of the educational component</b>	<i>4 (120)</i>
<b>Semester control/control measures</b>	<i>Exam</i>
<b>Class schedule</b>	<i>54 hours per semester (36 hours of lectures and 18 hours of practical classes)</i>
<b>Language of instruction</b>	<i>Ukrainian</i>
<b>Information about the course leader /teachers</b>	Lecturer: <a href="https://eco-paper.kpi.ua/pro-kafedru/vykladachi/trus-inna-mikolajivna.html">https://eco-paper.kpi.ua/pro-kafedru/vykladachi/trus-inna-mikolajivna.html</a> Practical / Seminar: <a href="https://eco-paper.kpi.ua/pro-kafedru/vykladachi/trus-inna-mikolajivna.html">https://eco-paper.kpi.ua/pro-kafedru/vykladachi/trus-inna-mikolajivna.html</a>
<b>Course placement</b>	<a href="https://do.ipk.kpi.ua/course/view.php?id=2597">https://do.ipk.kpi.ua/course/view.php?id=2597</a>

**Educational component program**

**1. Description of the educational component, its purpose, subject matter and learning outcomes**

*The implementation of insufficiently substantiated recommendations regarding the restructuring of society has led to a financial crisis. In addition, there is an ecological crisis due to irrational use of nature and deep negative shifts in the socio-economic and ecological development of the country. Currently, among European countries, Ukraine has one of the highest integral indicators of anthropogenic load on the environment. Inconsistency in the actions of state and local authorities, the unsatisfactory state of the state environmental monitoring system, the inability of the current ecological and economic mechanism of environmental management to arouse the interest of business entities in reducing the eco-destructive impact have led to an economic and ecological crisis of management in the field of environmental protection.*

*To effectively regulate the impact of human production and economic activities on the environment, it is necessary to organize the process of environmental management, which includes a reorientation from obtaining short-term economic benefits to fulfilling long-term obligations in the field of environmental protection process management, ensuring the environmental safety of the enterprise, which will have a financial benefit for society, because eliminating the consequences of environmental degradation is much more expensive than eliminating the causes of degradation.*

*The adoption of the law "On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period Until 2030" indicates the awareness of the need to restructure environmental policy*

at all levels and further implement an ecosystem approach in sectoral policy and improve the system of integrated environmental management.

Consolidating changes in the public administration system by reforming the state environmental management system, implementing European environmental standards and norms, improving environmental accounting and control systems, introducing financial and economic mechanisms to stimulate environmentally oriented structural transformations in the economy, introducing mechanisms to stimulate enterprises to energy efficiency, introducing e-governance, disseminating environmental knowledge, raising the environmental awareness of society, and informatization of the sphere of environmental protection and nature management will stabilize the environmental situation.

The development of the environmental management system will be facilitated by the introduction of international standards for environmental management systems at enterprises and companies.

**The subject of the educational component " Organization and Management of Environmental Activities "** is the implementation of approaches that will ensure the implementation of an ecosystem approach in sectoral policy and the improvement of the integrated environmental management system, the introduction of international standards for environmental management systems at enterprises and companies, which will contribute to the prevention of man-made and environmental disasters and the improvement of the state of the environment.

**The purpose of the educational component " Organization and management of environmental protection activities "**

The purpose of studying the educational component "Organization and Management of Environmental Protection Activities" is to provide future specialists with basic knowledge about the modern understanding of systemic theoretical and methodological ideas about environmental management in the context of global trends in the greening of human life, and to prepare them for the practical application of this knowledge in state institutions and enterprises at the regional and local levels. In accordance with the purpose, the training of bachelors in this specialty requires the formation of competencies in higher education applicants:

- understanding of the basic theoretical positions, concepts and principles of mathematical and socio-economic sciences;
- ability to use the basic principles and components of environmental management;
- ability to participate in the development of a system for managing and treating production and consumption waste;
- the ability to inform the public about the state of environmental safety and balanced use of nature;
- the ability to master international and domestic experience in solving regional and transboundary environmental problems;
- ability to participate in the management of environmental protection activities and/or environmental projects;
- the ability to develop projects for calculating maximum permissible discharges and emissions, to monitor compliance with GDS and GDV standards.

According to the requirements of the educational component program " **Organization and Management of Environmental Protection Activities "**, after completing it, higher education applicants must demonstrate the following program learning outcomes :

- demonstrate an understanding of the basic principles of managing environmental activities and/or environmental projects;
- understand basic environmental laws, rules and principles of environmental protection and nature management;
- use the management principles on which the environmental safety system is based
- identify factors that determine the formation of landscape and biological diversity;
- solve problems in the field of environmental protection using generally accepted and/or standard approaches and international and domestic experience;
- demonstrate skills in assessing unforeseen environmental problems and making thoughtful choices about how to solve them;
- be able to predict the impact of technological processes and production on the environment;

- participate in the development and implementation of projects aimed at optimal management and treatment of industrial and municipal waste;
- be able to form effective communication strategies to convey ideas, problems, solutions and own experience in the field of ecology;
- be able to communicate the results of activities to a professional audience and the general public, make presentations and reports;
- be able to explain the social, economic and political consequences of implementing environmental projects;
- choose the optimal strategy for holding public hearings on problems and forming territories of the nature reserve fund and ecological network;
- be able to formulate requests and determine actions that ensure compliance with the norms and requirements of environmental legislation;
- participate in the development of projects and practical recommendations for environmental conservation;
- demonstrate skills in implementing environmental protection measures and projects.

## **2. Prerequisites and postrequisites of the educational component (place in the structural and logical scheme of training according to the relevant educational program)**

The study of the educational component "**Organization and Management of Environmental Activities**" is based on the principles of integrating various knowledge obtained by higher education students during the three years of undergraduate studies while studying the educational component of the natural sciences and engineering and technical direction: "Environmental Legislation and Environmental Law." **The educational component "Organization and Management of Environmental Protection Activities"** ensures the implementation of a bachelor's project.

## **3. Content of the educational component**

### **Section 1. Regulatory and methodological foundations of environmental management**

Topic 1. Implementation of the principles of state environmental policy in Ukraine

Topic 2. Development of environmental management

### **Section 2. Environmental management systems**

Topic 3. General provisions of the state environmental management system

Topic 4. General characteristics of the corporate environmental management system.

Topic 5. System of public environmental management and local environmental self-government

### **Section 3. Special functions of state environmental management**

Topic 6. Application of administrative tools for the implementation of state environmental policy

Topic 7. Environmental audit

Topic 8. Legal liability for violations of environmental law

### **Section 4. Implementation of the ecosystem approach in sectoral policy and improvement of the integrated environmental management system**

Topic 9. Environmental management as a prerequisite for sustainable development

Topic 10. Management in the field of protection of the natural resource potential of Ukraine

### **Chapter 5. Economic mechanisms for managing environmental activities**

Topic 11. Payment for natural resources and sources of their formation

Topic 12. Determination of fees and collection of payments for environmental pollution in Ukraine

Topic 13. Economic, ecological and social effectiveness of environmental protection measures

### **Chapter 6. Basic principles of international experience in environmental security management in the context of sustainable development**

Topic 14. Improving the efficiency of public administration in Ukraine, taking into account international experience

Topic 15. Environmental education

#### 4. Educational materials and resources

##### **Basic literature**

1. *Organization and management of environmental protection activities: subst.* / I. M. Trus, M. M. Tverdokhlib, M. D. Gomelya. – Kyiv, Publishing House “Kondor”, 2024. – 464 p.
2. *Ecological aspects of environmental quality management: textbook* / I.M. Trus, Ya.V. Radovenchyk, M.D. Gomelya. – K.: Condor Publishing House, 2020. – 208 p.
3. *Organization and management in environmental protection activities: a textbook.* / N. M. Samoilenko, D. V. Rayko, V. I. Averchenko. – Kharkiv: NTU “KhPI”, Publishing House “Leader”, 2018. – 174 p.
4. *Law of Ukraine "On the Basic Principles (Strategy) of the State Environmental Policy of Ukraine for the Period Until 2030"*  
<https://zakon.rada.gov.ua/laws/show/2697-19#Text>
5. *The Law of Ukraine "On Environmental Protection"*  
<https://zakon.rada.gov.ua/laws/show/1264-12#Text>
6. *On the protection of atmospheric air*  
<https://zakon.rada.gov.ua/laws/show/2707-12#Text>
7. *Water Code of Ukraine*  
<https://zakon.rada.gov.ua/laws/show/213/95-%D0%B2%D1%80#Text>
8. *The Law of Ukraine "On Waste"*  
<https://zakon.rada.gov.ua/laws/show/187/98-%D0%B2%D1%80#Text>
9. *Code of Ukraine on Subsoil*  
<https://zakon.rada.gov.ua/laws/show/132/94-%D0%B2%D1%80#Text>
10. *Land Code of Ukraine*  
<https://zakon.rada.gov.ua/laws/show/2768-14#Text>
11. *Convention on Biological Diversity of 1992*  
[https://zakon.rada.gov.ua/laws/show/995\\_030#Text](https://zakon.rada.gov.ua/laws/show/995_030#Text)
12. *Forest Code of Ukraine*  
<https://zakon.rada.gov.ua/laws/show/3852-12#Text>
13. *Law of Ukraine "On the Nature Reserve Fund of Ukraine"*  
<https://zakon.rada.gov.ua/laws/show/2456-12#Text>
14. *Tax Code of Ukraine from 01.01.2022*  
<https://zakon.rada.gov.ua/laws/show/2755-17#Text>

##### **Additional literature**

1. *Law of Ukraine "On State Control over the Use and Protection of Lands"*  
<https://zakon.rada.gov.ua/laws/show/963-15#Text>
2. *Law of Ukraine " On the National Program for Toxic Waste Management "*  
<https://zakon.rada.gov.ua/laws/show/1947-14#Text>
3. *Law of Ukraine " On Radioactive Waste Management "*  
<https://zakon.rada.gov.ua/laws/show/255/95-%D0%B2%D1%80#Text>
4. *Resolution of the Cabinet of Ministers of Ukraine dated November 8, 2017 No. 820 "On Approval of the National Waste Management Strategy in Ukraine until 2030"*  
<https://zakon.rada.gov.ua/laws/show/820-2017-%D1%80#Text>
5. *Regulations on the State Agency of Water Resources of Ukraine , approved by the Resolution of the Cabinet of Ministers of Ukraine dated August 20, 2014 No. 393*  
<https://zakon.rada.gov.ua/laws/show/393-2014-%D0%BF#n8>
6. *Regulations on the State Agency of Forest Resources of Ukraine , approved by the Resolution of the Cabinet of Ministers of Ukraine dated October 8, 2014 No. 521*  
<https://zakon.rada.gov.ua/laws/show/521-2014-%D0%BF#n8>
7. *Regulations on the State Agency of Ukraine for Exclusion Zone Management , approved by the Resolution of the Cabinet of Ministers of Ukraine dated October 22, 2014 No. 564*  
<https://zakon.rada.gov.ua/laws/show/564-2014-%D0%BF#n8>

8. *Regulations on the State Service of Geology and Subsoil of Ukraine*, approved by the Resolution of the Cabinet of Ministers of Ukraine dated December 30, 2015 No. 1174  
<https://zakon.rada.gov.ua/laws/show/1174-2015-%D0%BF#n8>
9. *Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters*  
[https://zakon.rada.gov.ua/laws/show/994\\_015#Text](https://zakon.rada.gov.ua/laws/show/994_015#Text)

### **Information resources on the Internet**

1. Ministry of Environmental Protection and Natural Resources of Ukraine - <https://mepr.gov.ua/>

## **Educational content**

### **5. Methodology for mastering the educational component (educational component)**

#### **Lecture classes**

Lectures are aimed at:

- providing modern, holistic, interdependent knowledge in the educational component "Organization and Management of Environmental Protection Activities", the level of which is determined by the target setting for each specific topic;
- ensuring creative work of higher education students together with the teacher during the lecture;
- fostering professional and business qualities in higher education students and developing independent creative thinking in them;
- developing the necessary interest in higher education applicants and providing direction for independent work;
- determining the effectiveness of the implementation of national environmental policy, forecasting prospects and development directions for the coming years;
- reflection of the methodical processing of the material for its better perception (highlighting the main provisions, conclusions, recommendations, clear and adequate wording);
- use of visual materials for demonstration, combining them, if possible, with the demonstration of results and samples;
- teaching research materials in clear and high-quality language, observing structural and logical connections, explaining all newly introduced terms and concepts;
- accessibility of the presented information for perception by a given audience.

<b>Title of the lecture topic and list of main questions (list of didactic aids, references to literature and tasks for the SRS)</b>	<b>Hours</b>
<b>Section 1. Regulatory and methodological foundations of environmental management</b>	
<b>Topic 1. Implementation of the principles of state environmental policy in Ukraine</b> Existing problems and current state of the environment in Ukraine. Purpose, foundations, principles and instruments of state environmental policy. Strategic goals and objectives of state environmental policy. References: [1] p . 9-17; [2] p . 7-11; [3] p . 7-49; 3. Tasks for the VTS. Principles and functions of management. Procedures of the management process.	<b>2</b>
<b>Topic 2. Development of environmental management</b> Stages of development of the field of environmental management in Ukraine and abroad. Requirements for environmental management References: [1] pp . 18-28; [2] pp . 14-23; [3] pp . 49-52. Tasks for the CTS. Mechanisms of environmental management. The place and role of management decisions in the process of enterprise functioning.	<b>2</b>
<b>Section 2. Environmental management systems</b>	

<p><b>Topic 3. General provisions of the state environmental management system</b>  <i>Functions and hierarchy of the state environmental management system. State administration bodies.</i>  <i>References: [1] pp . 29-60; [3] pp . 56-89.</i>  <i>Tasks for the VTS. Levels of environmental management.</i></p>	<b>2</b>
<p><b>Topic 4. General characteristics of the corporate environmental management system.</b>  <i>Fundamental approaches, basic principles of creating a corporate governance system. The essence and mechanisms of corporate governance. The Charter of the International Chamber of Commerce, its principles. Environmental aspects of requirements for management personnel.</i>  <i>References: [1] pp . 61-84; [3] pp . 94-136.</i>  <i>Independent work assignment: Standard system requirements for corporate environmental policies.</i></p>	<b>2</b>
<p><b>Topic 5. System of public environmental management and local environmental self-government</b>  <i>The role and functions of public environmental management. Aarhus Convention. Forms of public participation. Functions of public environmental management. The role of non-governmental organizations in the process of implementing the principles of balanced development at all levels. Forms of public participation in environmental protection activities. Means and mechanisms for involving the public in environmental activities. Environmental aspects and functions of local self-government. Strategic tasks of local authorities.</i>  <i>References: [1] pp . 85-94; [3] pp . 137-142.</i>  <i>Tasks for the VTS. Basic principles of local environmental policy. Solving local environmental programs in the countries of Central and Eastern Europe. Local environmental audit programs.</i></p>	<b>2</b>
<b>Section 3. Special functions of state environmental management</b>	
<p><b>Topic 6. Application of administrative tools for the implementation of state environmental policy</b>  <i>Environmental impact assessment. Current status of the process of implementing environmental certification in Ukraine. Basic principles and benefits of environmental certification. Purpose and principles of environmental licensing. Environmental certification and insurance. Environmental monitoring. Environmental quality standards. Methods for determining environmental risk. Purpose, tasks, features of developing environmental impact assessment materials. Assessment and selection of environmental characteristics. Product life cycle. Environmental labeling. Matrix for selecting environmental cleanliness criteria. Environmental marketing, engineering. Tasks of environmental engineering regarding the creation and implementation of environmental protection projects. Leasing objects and subjects. Scheme for implementing a classic leasing operation. Environmental management.</i>  <i>References: [1] p . 95-191; [2] p . 110-157; 164-202; [3] p . 43-46</i>  <i>Tasks for the VTS. Environmental regulation. The procedure for developing and approving standards for maximum permissible emissions and discharges of pollutants. The procedure for developing materials for assessing environmental impact. Provide an assessment of the environmental characteristics of the environment, management systems, production systems. Ecological modernization of production. Types of wear and tear. Voluntary and mandatory certification. Maximum permissible concentration, maximum permissible discharge and maximum permissible load.</i></p>	<b>4</b>
<p><b>Topic 7. Environmental audit</b>  <i>Objectives and benefits of conducting an environmental audit. Objects and subjects of the audit. Conditions for conducting an audit. Eco-audit in Ukraine. Preparation of an audit report.</i>  <i>References: [1] pp . 192-196; [2] pp . 157-163; [3] pp . 43-46</i>  <i>Task for the CTS. List the system of goals of a comprehensive express eco-audit of an enterprise.</i></p>	<b>2</b>
<p><b>Topic 8. Legal liability for violations of environmental law</b></p>	<b>2</b>

<p><i>Classification of environmental offenses. Disciplinary, civil (property), criminal, administrative types of liability</i></p> <p><i>References: [1] pp . 197-211; [3] pp . 43-46; [5].</i></p> <p><i>Tasks for the SRS. Types of disciplinary sanctions</i></p>	
<p><b>Section 4. Implementation of the ecosystem approach in sectoral policy and improvement of the integrated environmental management system</b></p>	
<p><b>Topic 9. Environmental management as a prerequisite for sustainable development</b></p> <p><i>Air quality management. Water protection management. Land and soil protection. Waste management. State management in the field of forest protection, protection and regeneration. Subsoil.</i></p> <p><i>References: [1] pp . 213-322; [2 ] pp . 32-33; [4].</i></p> <p><i>Tasks for the VRS. Current state of surface and groundwater in Ukraine. Current state of atmospheric air in Ukraine. Current state of soils and land resources of Ukraine. Analysis of global and domestic experience in implementing integrated water resources management.</i></p>	2
<p><b>Topic 10. Management in the field of protection of the natural resource potential of Ukraine</b></p> <p><i>Ecological Network of Ukraine – a modern concept of preserving biological and landscape diversity. Climate change. Emergency situations. Exclusion zone and zone of unconditional (mandatory) resettlement. Ecological problems of Donbas. Biological safety.</i></p> <p><i>References: [1] pp . 323-338; [4].</i></p> <p><i>Tasks for the VTS. El Niño and La Niña phenomena as global climate anomaly phenomena</i></p>	2
<p><b>Chapter 5. Economic mechanisms for managing environmental activities</b></p>	
<p><b>Topic 11. Payment for natural resources and sources of their formation</b></p> <p><i>Methods of economic management of rational use of natural resources.</i></p> <p><i>Payments for resources, their types and standards. Rent for the use of subsoil for the extraction of minerals. Rent for the use of subsoil for purposes not related to the extraction of minerals. Rent for the use of radio frequency resources of Ukraine. Rent for the special use of water. Rent for the special use of forest resources. Fee for land resources.</i></p> <p><i>Literature: [ 1 ] 339-387; [ 2 ] 89-101.</i></p> <p><i>Tasks for the VTS. Norms of payment for the use of natural resources</i></p>	4
<p><b>Topic 12. Determination of fees and collection of payments for environmental pollution in Ukraine</b></p> <p><i>Pollution charges, their types and calculation criteria. Determination of the amount of the charge for emissions of pollutants into the atmosphere by stationary and mobile sources of pollution. Amount of charges for discharges into surface waters, territorial and inland sea waters and groundwater. Calculation of the amount of charges for waste disposal in the natural environment.</i></p> <p><i>Literature: [ 1 ] 388-398; [ 2 ] 88-101 .</i></p> <p><i>Tasks for the VTS. To familiarize yourself with the methodology for determining the amount of damage caused to land and soil as a result of emergency situations and/or armed aggression and hostilities during martial law</i></p>	4
<p><b>Topic 1 3. Economic, ecological and social effectiveness of environmental protection measures</b></p> <p><i>Types of calculations of economic losses: actual, possible, averted, liquidated, potential losses. Social, environmental and economic results of environmental protection measures. Factors influencing the economic efficiency of the implementation of environmental protection measures.</i></p> <p><i>Literature: [ 1 ] 399-407; [ 2 ] 102-106 .</i></p> <p><i>Tasks for the CTC. Net economic effect. Total (absolute) economic efficiency of capital investments.</i></p>	2
<p><b>Chapter 6. Basic principles of international experience in environmental security management in the context of sustainable development</b></p>	

<p><b>Topic 14. Improving the efficiency of public administration in Ukraine, taking into account international experience</b></p> <p>United Nations Development Program. Cooperation of Ukraine with international environmental organizations. Management approaches to ensuring the rational use of natural resources from the perspective of analyzing foreign management practices in this area.</p> <p>References: [1] pp . 408-442; [2] pp . 23-32; [4].</p> <p>Tasks for the CTC. Modern public foundations and organizations engaged in environmental protection and restoration.</p>	<b>2</b>
<p><b>Topic 15. Environmental education</b></p> <p>Environmental education of the population is an important component of the international environmental policy of countries. Development and formation of formal and informal education at the Department of Ecology and Technology of Plant Polymers of Igor Sikorsky Kyiv Polytechnic Institute.</p> <p>References: [1] pp . 443-455; [3] pp . 43-46.</p> <p>Tasks for the CSE. Environmental education in developed countries.</p>	<b>2</b>
<b>Total</b>	<b>36</b>

### Practical classes

In the system of professional training of higher education applicants for this educational component, practical classes occupy 33.3% of the classroom load. Topics that cover a wide range of issues are presented for practical classes. They allow you to better understand the lecture material, master the methodology for assessing economic losses from environmental pollution, find out the impact of individual groups of pollutants on the environment and assess the degree of environmental risks, form an idea of environmental management systems and relevant mechanisms for its implementation.

The content of these classes and the methodology of their conduct should ensure the development of creative activity of the individual. They develop scientific thinking and the ability to use special terminology, allow you to check knowledge, so this type of work is an important means of operational feedback. Practical classes should perform not only cognitive and educational functions, but also contribute to the growth of higher education students as creative workers in the field of environmental protection.

The main tasks of the practical training cycle :

- to help higher education students systematize , consolidate and deepen knowledge theoretical nature in the field of organization and management of environmental protection activities ;
- to teach higher education students the techniques solving practical problems ,
- promote mastery skills and skills performing calculations , graphics and others tasks ;
- to teach them to work with scientific and reference literature and diagrams ;
- to develop skills to study independently , that is master methods , ways and techniques self-study , self-development and self-control.

<b>Title of the topic of the practical lesson and list of main questions (list of didactic material, references to literature and tasks for the CTS)</b>	<b>Hours</b>
<p><b>State Administration for the Use and Protection of Atmospheric Air</b></p> <p>Law of Ukraine "On Atmospheric Air Protection". Atmospheric air management in Ukraine. Measures to reduce atmospheric air pollution. State accounting and monitoring in the field of atmospheric air protection. Purpose, tasks of environmental protection management in the field of atmospheric air. Norms regulating atmospheric air management in Ukraine. Characteristics of sources of emissions into the atmospheric air. Atmospheric air pollution by motor vehicles in Ukraine. Offenses in the field of atmospheric air protection.</p> <p>References: 2 [32-48], 6.</p> <p>Task for independent work: Current state of atmospheric air in Kyiv and identification of sources of its pollution. Monitoring by the State Hydrometeorological Service of Ukraine.</p>	<b>2</b>

<p><b>State administration in the field of water use and protection and water resources regeneration</b></p> <p>Water Code of Ukraine and the EU Water Framework Directive (Directive 2000/60/EC). Water Fund of Ukraine. Classification of bodies that manage water use and protection. Competence of state administration bodies in the field of water use and protection. Control over the use and protection of water and the reproduction of water resources. Adaptation of Ukrainian legislation in the field of water protection to European legislation. Economic regulation of rational use and protection of water and the reproduction of water resources. Norms in the field of water use and protection and the reproduction of water resources. Liability for violation of water legislation</p> <p>References: 2 [49-69], 7.</p> <p>Tasks for independent work: Current state of water bodies of the hydrosphere. Territorial distribution of water resources of Ukraine. Forecast resources of fresh groundwater of Ukraine.</p>	<b>2</b>
<p><b>State administration in the field of waste management</b></p> <p>Law of Ukraine "On Waste". State program of waste management in Ukraine. Main legislative and regulatory documents regulating waste management. Main principles of state policy in the field of waste management. Directions of solid household waste management. Management of municipal solid waste. Integration into the EU waste market and the European waste management system.</p> <p>Literature: 2 [79-89], 8.</p> <p>Task for independent work: Waste – as a base of secondary raw materials for industry. Extended producer responsibility. Zero Waste – Refuse, Reduce, Reuse, Recycle, Rot</p>	<b>2</b>
<p><b>State administration in the field of use and protection of mineral resources</b></p> <p>Subsoil Code. Legislative framework for mineral resources management in Ukraine. State administration bodies in the field of mineral resources management. State administration bodies in the field of natural resources use. Land Code of Ukraine. General characteristics of land resources of Ukraine. Purpose of land use management in the exploration and development of mineral deposits. Planning of ways, means and objects of land use management in Ukraine. Characteristics of the land fund of Ukraine. Competence of various branches of government in the field of environmental protection activities management in agriculture. Economic mechanism of agricultural management. State administration bodies in the field of environmental protection activities in agriculture of Ukraine. State control in the field of use and protection of agricultural lands.</p> <p>References: 2 [69-78], 8, 10.</p> <p>Tasks for independent work: Mineral and raw material base of Ukraine and provision of mineral resources for use. Processes of extraction and processing of uranium ores as the main source of radioactive waste formation. Current state of land resources of Kyiv and identification of sources of their pollution. Rights and obligations of users of agricultural facilities. Organic farming.</p> <p>Modular test (1 hour)</p>	<b>1</b>
<p><b>State administration in the field of use and protection of flora and fauna</b></p> <p>State control in the field of protection, use and reproduction of the plant world Plant resources of Ukraine. Characteristics of biodiversity in Ukraine. Natural zones of Ukraine. Characteristics of taxon representatives in Ukraine. Current maximum indicators of biodiversity. Negative anthropogenic impact on biodiversity in Ukraine. Forecast, growth of "red lists" in Ukraine. Law of Ukraine "On the Animal World". Priority areas of management in the field of preserving animal diversity. Recommendations for practical actions to increase the biodiversity of Ukraine. The main factors of the current decrease in the sustainability of biodiversity within Ukraine. State control in the field of protection, use and reproduction of the animal world</p> <p>Literature: 11.</p>	<b>2</b>

<i>Task for independent work: Management of the conservation of plant and animal diversity in Ukraine at the regional level (using the example of a specific region).</i>	
<p><b>State regulation and management in the field of protection and use of territories and objects of nature reserves and forest funds of Ukraine</b></p> <p><i>Law of Ukraine "On the Nature Reserve Fund of Ukraine". Structure and functions of state administration in the field of the nature reserve fund. Specially authorized bodies in the field of reserve affairs, rights of citizens and public organizations. Legislative acts aimed at solving the problems of preserving biological and landscape diversity. Reserves and national natural parks of Ukraine. Main natural regions of the eco-network. Forest Code of Ukraine. Law of Ukraine "On Environmental Protection". Competences of the Verkhovna Rada of Ukraine, regional, district and city Councils of People's Deputies in the field of regulating forest relations</i></p> <p><i>Literature: 12, 13.</i></p> <p><i>Task for independent work: State management in the field of use and protection of the nature reserve fund at the regional level (using the example of a specific region).</i></p>	<b>2</b>
<p><b>Public administration healthcare of Ukraine</b></p> <p><i>Regulatory laws in the field of health care. Ministries responsible for environmental protection and health. Directions of the policy of improving the health of the population of Ukraine. Financial and economic mechanism of state regulation of the health care sector. Ways to improve state policy and public administration of the domestic medical industry. Comparative analysis of health care policy of the World Health Organization, the countries of the European Union and Ukraine.</i></p> <p><i>Literature: 4.</i></p> <p><i>Task for independent work: Health assessment measure.</i></p>	<b>2</b>
<p><b>Economic management methods environmental protection activities</b></p> <p><i>Economic methods of managing rational environmental use and their types. Economic mechanism of environmental regulation in Ukraine. Payments for resources, their types and standards. Main directions of improving resource taxation. Calculation of payments for environmental pollution, their types and accrual criteria</i></p> <p><i>References: 2 [89-106], 14.</i></p> <p><i>Independent work task: Identify the main shortcomings in the mechanism for collecting resource payments</i></p>	<b>2</b>
<p><b>International experience in environmental management</b></p> <p><i>International programs in the field of environmental protection and rational use of natural resources. Environmental policy of developed foreign countries. Specificity of foreign environmental legislation and the mechanism of its validity . International environmental cooperation . Participation of Ukraine in international cooperation in the field of environmental protection.</i></p> <p><i>Literature: 4.</i></p> <p><i>Tasks for independent work:</i></p> <p><i>International experience in river basin management. International principles of waste management.</i></p> <p><i>Modular test (1 hour)</i></p>	<b>1</b>
<b>Total</b>	<b>18</b>

### **Ensuring program outcomes through educational components**

Program result	Lecture classes	Practical and laboratory classes, individual assignments
<i>Demonstrate an understanding of the basic principles of managing environmental activities and/or environmental projects.</i>	<i><u>Topic 1.</u> Implementation of the principles of state environmental policy in Ukraine</i>	

<i>Understand basic environmental laws, rules, and principles of environmental protection and nature management.</i>	<i><u>Topic 2. Development of environmental management</u></i>	
<i>Use the management principles on which the environmental safety system is based.</i>	<i><u>Topic 3. General provisions of the state environmental management system</u> <u>Topic 4. General characteristics of the corporate environmental management system.</u></i>	
<i>Identify factors that determine the formation of landscape and biological diversity.</i>		<i><u>Practical lesson 6. State regulation and management in the field of protection and use of territories and objects of nature reserves and forest funds of Ukraine</u></i>
<i>Solve problems in the field of environmental protection using generally accepted and/or standard approaches and international and domestic experience.</i>	<i><u>Topic 14. Improving the efficiency of public administration in Ukraine, taking into account international experience</u></i>	
<i>Demonstrate skills in assessing unforeseen environmental problems and making thoughtful choices about how to solve them.</i>	<i><u>Topic 6. Application of administrative tools for the implementation of state environmental policy</u></i>	
<i>Be able to predict the impact of technological processes and production on the environment.</i>	<i><u>Topic 7. Environmental audit</u></i>	
<i>Participate in the development and implementation of projects aimed at optimal management and treatment of industrial and municipal waste.</i>	<i><u>Topic 9. Environmental management as a prerequisite for sustainable development</u> <u>Topic 10. Management in the field of protection of the natural resource potential of Ukraine</u></i>	<i><u>Practical lesson 3. State administration in the field of waste management</u></i>
<i>Be able to form effective communication strategies to convey ideas, problems, solutions, and own experience in the field of ecology.</i>		<i><u>Practical lesson 9. International experience in environmental management</u></i>
<i>Be able to communicate the results of activities to a professional audience and the general public, make presentations and announcements.</i>		<i><u>Practical lesson 7. Public administration healthcare of Ukraine</u></i>
<i>Be able to explain the social, economic, and political consequences of implementing environmental projects.</i>	<i><u>Topic 12. Determination of fees and collection of payments for environmental pollution in Ukraine</u></i>	

	<u>Topic 1 3. Economic , ecological and social effectiveness of environmental protection measures</u>	
<i>Choose the optimal strategy for holding public hearings on problems and the formation of territories of the nature reserve fund and ecological network.</i>	<u>Topic 5. System of public environmental management and local environmental self-government</u>	
<i>Be able to formulate requests and determine actions that ensure compliance with the norms and requirements of environmental legislation.</i>		<u>Practical lesson 1. State management in the field of use and protection of atmospheric air</u> <u>Practical lesson 2. State management in the field of water use and protection and water resources regeneration</u>
<i>Participate in the development of projects and practical recommendations for environmental conservation.</i>		<u>Practical lesson 5. State management in the field of use and protection of flora and fauna</u> <u>Practical lesson 6. State regulation and management in the field of protection and use of territories and objects of nature reserves and forest funds of Ukraine</u>
<i>Demonstrate skills in implementing environmental protection measures and projects.</i>		<u>Practical lesson 8. Economic management methods environmental protection activities</u> <u>Implementation of the RGR</u>

## 6. Independent work of a higher education student/postgraduate student

*Independent work takes up 55% of the time of studying the credit module, including preparation for the exam. The main task of independent work of higher education applicants is to master scientific knowledge in areas that are not included in the list of lecture questions through personal search for information, the formation of an active interest in a creative approach to educational work. In the process of independent work within the educational component, a higher education applicant must learn to deeply analyze the issues presented for consideration, process them and come to their own well-founded conclusions.*

<i>Title of the topic to be studied independently</i>	<i>Number of hours of CTC</i>
<b>Section 1. Regulatory and methodological foundations of environmental management</b>	
<b>Topic 1. Implementation of the principles of state environmental policy in Ukraine</b> <i>The principle of precautionary intervention. The principle of naturalness. Hierarchies of mixed systems. General problems of harmonizing the interaction of society and nature.</i>	<b>2</b>

<i>The economic mechanism of the Law of Ukraine "On Environmental Protection". Modern public funds and organizations engaged in environmental protection and restoration. References: [2] p . 7-11; [3] p . 7-49; 3.</i>	
<b>Topic 2. Development of environmental management</b> <i>Standard model of environmental management and stages of its implementation. System of normative regulation of environmental management. Stages of implementation of management innovations. "Hard" and "soft" management regime. References: [2] pp . 14-23; [3] pp . 49-52.</i>	<b>2</b>
<b>Section 2. Environmental management systems</b>	
<b>Topic 3. General provisions of the state environmental management system</b> <i>Subjects of macroecological management. Subjects of microecological management. Levels of ecological management. References: [3] pp . 56-89.</i>	<b>2</b>
<b>Topic 4. General characteristics of the corporate environmental management system.</b> <i>Evaluating the effectiveness of corporate governance. Motivating personnel in management. References: [3] pp . 94-136.</i>	<b>2</b>
<b>Topic 5. System of public environmental management and local environmental self-government</b> <i>Environmental rights and responsibilities of citizens in the field of public environmental management. Local agenda for the 21st century. Improving management of settlements. References: [3] pp . 137-142.</i>	<b>1</b>
<b>Section 3. Special functions of state environmental management</b>	
<b>Topic 6. Application of administrative tools for the implementation of state environmental policy</b> <i>Eco-management system in Ukraine. Main factors in the formation of a company's management culture. Purpose and principles of environmental licensing and certification. Possibilities of conducting environmental insurance in Ukraine. Corporate culture. References: [2] pp . 110-157; 164-202; [3] pp . 43-46</i>	<b>1</b>
<b>Topic 7. Environmental audit</b> <i>Preparation of an audit report. Certification of eco-auditors. Eco-audit in the modern economy of Ukraine. References: [2] pp . 157-163; [3] pp . 43-46</i>	<b>1</b>
<b>Topic 8. Legal liability for violations of environmental law.</b> <i>Material liability for violation of environmental legislation. Concept and features of environmental and legal liability for violation of environmental legislation. Concept of economic and legal liability for environmental offenses References: [3] pp . 43-46; [5].</i>	<b>1</b>
<b>Section 4. Implementation of the ecosystem approach in sectoral policy and improvement of the integrated environmental management system</b>	
<b>Topic 9. Environmental management as a prerequisite for sustainable development</b> <i>The right to general water use. The right to special water use. Control in the field of land use and protection. References: [2 ] pp . 32-33; [4].</i>	<b>1</b>
<b>Topic 10. Management in the field of protection of the natural resource potential of Ukraine</b> <i>State management in the field of formation, preservation and use of the ecological network of Ukraine References: [4].</i>	<b>1</b>
<b>Chapter 5. Economic mechanisms for managing environmental activities</b>	
<b>Topic 11. Payment for natural resources and sources of their formation</b>	<b>2</b>

<i>Economic evaluation of natural resources. Natural and cost characteristics of natural resource potential. Cost, effective cost-resource, market and rent approaches to economic evaluation of natural resources. References: [2] pp . 89-101.</i>	
<b>Topic 12. Determination of fees and collection of payments for environmental pollution in Ukraine</b> <i>Legislative framework of environmental economics. Types of damage from environmental damage. Basic methods of quantitative assessment of economic damage. Financial mechanisms of environmental protection activities. Standards and system of collection for environmental pollution. Get acquainted with the methodology for calculating the amount of compensation for damage caused to the state as a result of violation of legislation on the protection and rational use of water resources References: [2] pp . 88-101 .</i>	<b>2</b>
<b>Topic 13. Economic, ecological and social effectiveness of environmental protection measures</b> <i>Socio-ecological-economic strategies of Ukraine for harmonious development. Bilateral agreements and treaties of Ukraine in the field of environmental protection. Mechanisms for implementing ecological and economic goals (three approaches). The main reasons for market "failures" in the environmental sphere. References: [2] pp . 102-106 .</i>	<b>2</b>
<b>Chapter 6. Basic principles of international experience in environmental security management in the context of sustainable development</b>	
<b>Topic 14. Improving the efficiency of public administration in Ukraine, taking into account international experience</b> <i>European experience of public administration in the field of environmental protection. References: [2] pp . 23-32; [4].</i>	<b>1</b>
<b>Topic 15. Environmental education</b> <i>Environmental education in the process of professional development of management level specialists. Algorithm of environmental training of management personnel. References: [3] pp . 43-46.</i>	<b>1</b>
<b>RGR</b>	<b>10</b>
<b>Preparation for the ICR</b>	<b>4</b>
<b>Exam preparation</b>	<b>30</b>
<b>Total</b>	<b>66</b>

## Policy and control

### 7. Educational component policy (educational component)

#### Rules for class attendance and behavior in class

*Attendance at classes is a mandatory component of assessment. Higher education students are required to take an active part in the educational process, not to be late for classes or miss them without a good reason, not to interfere with the teacher conducting classes, and not to be distracted by activities unrelated to the educational process.*

#### Rules for assigning incentive and penalty points

- *Incentive points can be awarded by the teacher exclusively for performing creative works in the educational component or for additional completion of online specialized courses with the receipt of the corresponding certificate:*
  - <https://www.coursera.org/learn/global-environmental-management>
  - <https://www.coursera.org/learn/circular-economy>
  - <https://www.coursera.org/learn/water-management>

- <https://www.coursera.org/learn/environmental-management-ethics>
- <https://www.coursera.org/learn/global-environmental-management>

But their sum cannot exceed 10 % of the rating scale .

- There are no penalty points within the educational component.

### Deadline and Rescheduling Policy

In the event of arrears for the educational component or any force majeure circumstances, higher education applicants must contact the teacher via available (provided by the teacher) communication channels to resolve problematic issues and agree on an algorithm of actions for work-out.

### Academic Integrity Policy

Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the lack of references when using printed and electronic materials, quotes, opinions of other authors. Hints and copying when writing tests, conducting classes are unacceptable; taking an exam for another higher education applicant ; copying materials protected by the copyright system without the permission of the author of the work. The policy and principles of academic integrity are defined in Section 3 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". More details: <https://kpi.ua/code>

### Academic Conduct and Ethics Policy

Higher education students must be tolerant, respect the opinions of others, formulate objections in a correct form, and provide constructive feedback in class.

The norms of ethical behavior of higher education students and employees are defined in Section 2 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". More details: <https://kpi.ua/code>

## 8. Types of control and rating system for assessing learning outcomes (RSO)

Distribution of study time by types of classes and tasks from the educational component according to the working curriculum:

Semester	Study time		Distribution of teaching hours				Control measures		
	Loans	academic year	Lectures	Practical	Lab work	CRC	MKR	RGR	Semester control
4	4	120	36	18	–	66	1	1	exam

The rating of a higher education applicant for the educational component consists of the points he receives for:

The rating of a higher education applicant for a credit module consists of the points he receives for:

1. presentations with a report on the topic, which are presented for practical classes or for independent work;
2. active participation in practical classes;
3. completion of a modular test (divided into 2 tests of 45 minutes each);
4. performing calculation work
5. answer on the exam.

### Rating (weighting) points system and evaluation criteria

1. Completing tasks in practical classes

Presentation with a report

Weighted score – 5. The maximum number of points for all practical classes is 5 points  $\times 2 = 10$  points.

Report evaluation criteria:

Quality of the report and its defense	Points
---------------------------------------	--------

<i>The topic of the report is fully disclosed; the higher education applicant thoroughly explains all aspects of the relevant topic, draws the necessary conclusions and generalizations, and clearly answers the questions posed.</i>	5
<i>The report provides a sufficient number of facts and examples; proper analysis or comparison is not made; the answers to the questions have some inaccuracies</i>	4
<i>The report does not provide enough facts and examples; proper analysis has not been conducted; conclusions are not clearly formulated; answers to questions are unclear or contain some inaccuracies</i>	3
<i>The topic of the report is not sufficiently covered; there are no conclusions; there are no answers to individual questions.</i>	2
<i>The report does not correspond to the formulated topic; most of the questions raised remained unanswered</i>	1
<i>The report is not ready.</i>	0

*Participation in the discussion of issues raised in the practical session*

*The weighted score is 1, the maximum number of points for all practical classes is 9 practical classes X 1 point = 9 points.*

## *2. Performing calculation tasks*

*The maximum number of points for completing the calculation task is 11 points.*

<i>Quality of the report and its defense</i>	<i>Points</i>
<i>The calculation method and results are correct.</i>	<i>10...11</i>
<i>There are some inaccuracies and technical errors in the calculations.</i>	<i>8...9</i>
<i>Inaccuracies and numerous errors in calculations were made</i>	<i>4 – 7</i>
<i>The calculation methodology is violated, only basic calculations were made, the result has significant inaccuracies</i>	<i>1 – 3</i>
<i>Task not completed</i>	<i>0</i>

## *3. Modular test work:*

*The test is divided into 2 tests, each of which consists of 2 questions. Depending on the completeness and content of the answer to the theoretical questions, higher education applicants receive from 0 to 5 points. Thus, the maximum number of points for the test is 5 points ×2 ×2 = 20 points.*

*Criteria for evaluating test questions:*

<i>Completeness and characteristics of the answer</i>	<i>Points</i>
<i>Full answer to the question</i>	<i>5</i>
<i>A fairly complete answer with minor inaccuracies</i>	<i>4</i>
<i>The answer does not provide enough facts, examples, and conclusions, or contains some inaccuracies.</i>	<i>3</i>
<i>A partial answer has been given, or serious errors have been made.</i>	<i>2</i>
<i>The answer is superficial; there is no specific formulation of laws and terms.</i>	<i>1</i>
<i>"Unsatisfactory": Response not counted or missing</i>	<i>0</i>

*Thus, the maximum sum of points for the starting component of the credit module is:*

$$R_c = 5 \cdot 2 + 9 + 11 + 5 \cdot 2 \cdot 2 = 50 \text{ points}$$

*The examination component is 50% of R :*

$$R_e = 50$$

*The rating scale is:*

$$R = R_c + R_e = 50 + 50 = 100 \text{ points}$$

At the first certification, a higher education applicant receives a "pass" if his current rating is at least 7 points.

At the second certification, a higher education applicant gets "counted" if his current rating is at least 20 points.

A prerequisite for admission to the exam is to complete all practical classes, complete the MCR and RGR with a starting rating of at least 30 points.

During the exam, higher education applicants answer 4 questions on the exam paper. The questions are scored out of 12.5 points.

Criteria for evaluating exam questions:

<i>Completeness and characteristics of the answer</i>	<i>Points</i>
<i>Complete answer to the question (over 90% of the required information)</i>	<i>11– 12.5</i>
<i>A fairly complete answer with minor inaccuracies (more than 75% of the required information)</i>	<i>8– 10</i>
<i>The answer does not provide a sufficient number of facts, examples and conclusions, or contains some inaccuracies (more than 60% of the required information)</i>	<i>5– 7</i>
<i>The answer is incomplete, facts and examples are not provided (less than 60% of the required information)</i>	<i>1– 4</i>
<i>The answer is not counted or missing.</i>	<i>0</i>

The sum of the starting points obtained during the semester and all exam points is converted according to the table:

<b>Number of points</b>	<b>Rating</b>
95 ...100	perfectly
85 ...94	very good
75...84	good
65 ...74	satisfactorily
60...64	enough
RD <60	unsatisfactorily
Admission conditions not met	not allowed

## 9. Additional information on the educational component

### Approximate list of questions submitted for semester control

- Determine the place of environmental management in the system of other sciences. Give a modern conceptual approach to environmental management.
- What principles are used to manage environmental protection?
- Identify the historical aspects of the development of environmental legislation in Ukraine. Analyze the international experience of environmental legislation.
- Analyze and name the legislative acts that form the system of environmental legislation in the field of environmental protection.
- Describe the basic regulatory principles set out in the Declaration adopted at the UN World Conference on Environment and Development (Rio de Janeiro, 1992). Formulate general recommendations for the implementation of the principles of sustainable development.
- Describe the main requirements for environmental management. Analyze what problems need to be overcome at this stage for the effective functioning of environmental management.
- Give a classification of management by systemic characteristics. Propose a basic model of an environmental management system.
- Define the purpose of state environmental management. Explain why management is targeted. Define the main directions of state environmental management.
- Determine the legislative framework for targeted areas of management. Compare general and special management, identify their main functions.

10. Describe the entities that carry out macro- and micro-ecological management. Compare their powers in making management decisions.
11. List the existing levels of environmental management that reflect the administrative-territorial structure of the state. Describe sectoral management. Explain the interaction of territorial and sectoral management using the example of a separate enterprise.
12. Describe the functions of general government bodies.
13. Identify the bodies of special state administration. Identify and compare the target functions they perform.
14. Identify the prerequisites and benefits of implementing a corporate environmental management system. Analyze the basic principles of creating a corporate environmental management system.
15. Describe environmental impact assessment as one of the effective mechanisms of the state environmental management system.
16. Describe the global practice of environmental certification. Justify the current process of forming and implementing environmental certification in Ukraine.
17. List the principles of effective functioning of environmental certification. Justify the differences that exist between mandatory and voluntary certification. Identify the objects of mandatory environmental certification in the state system.
18. Justify the differences between environmental regulation and limitation. Describe the main indicators used to assess anthropogenic impact.
19. Describe the development of environmental standardization in Ukraine. Describe international, state, industry, and local standards. List the main shortcomings of environmental regulation at the current stage of its development.
20. List the main principles of Ukraine's state policy in the field of licensing. Justify licensing as an effective tool for environmental management.
21. Compare the strategic directions of environmental licensing: separate and integrated. List the main stages of environmental licensing.
22. Describe the development, establishment, and legislative design of Environmental Impact Assessment in Ukraine.
23. Describe the composition, content, and procedure for developing Environmental Impact Assessment materials.
24. Describe the powers of state bodies in the field of environmental monitoring. List the types and functions of environmental monitoring.
25. Identify the main grounds for developing an environmental passport. Provide the structure of an enterprise's environmental passport.
26. Describe the main stages, goals and objectives of product life cycle assessment. Propose a product life cycle diagram.
27. Compare the three types of environmental labeling. Identify the role of international standards in the field of environmental labeling. Provide a matrix of environmental criteria.
28. Describe the structure of a typical environmental management system audit process.
29. Describe the requirements for an audit plan and its structure. Compare mandatory and voluntary audits.
30. Describe the process of ecological modernization of production. Compare the main types of wear and tear: physical, functional, technological (moral), cost, ecological, managerial.
31. Determine how environmental marketing and engineering affect the efficiency of a corporation's investment activities.
32. Conduct a comparative analysis of direct and indirect participants in a leasing agreement. Determine the benefits of the lessor and the lessee.
33. Describe environmental insurance as an important lever for economic stimulation of environmental protection measures.
34. Describe the methods for determining economic losses from environmental pollution.
35. Explain how natural damage is assessed.
36. Describe the main functions of economic losses.
37. List the main methods for determining economic losses.

38. Explain the determination of the amount of payments for emissions of pollutants into the atmosphere.
39. Describe the economic, environmental, and social effects of environmental protection activities.
40. Public administration in the field of health care as a social phenomenon
41. Comparative analysis of health policy of the World Health Organization, the countries of the European Union and Ukraine.
42. Main directions of implementation of public health administration in Ukraine.
43. Basic principles of public administration in the field of health care.

**APPROXIMATE list of questions to be asked in the module test**

1. Describe the mechanisms of environmental management.
2. Describe the principles on which environmental management is based.
3. Briefly describe the requirements for effective environmental management.
4. List the basic regulatory principles for harmonizing the coexistence of humanity and nature, as set out in the Declaration adopted at the UN World Conference on Environment and Development (Rio de Janeiro, 1992).
5. Give a classification of management by systemic characteristics, briefly describe them.
6. Draw a basic model of an environmental management system.
7. Explain the biotic mechanism of ecological management.
8. Give a brief description of the ecological and economic balance of the territories.
9. Describe the system of natural resource inventories.
10. Explain the essence of the theoretical and methodological foundations of environmental management.
11. Explain the difference between "hard" and "soft" approaches in environmental management.
12. Describe the system-forming international principles of prevention, perpetrator, and cooperation.
13. Explain what the process of continuous improvement of the environmental management system consists of.
14. Define the state system of environmental management. Explain what the main task of management is.
15. List the target functions of state environmental management.
16. Describe the special functions of state environmental management.
17. Name the bodies of general state administration and determine the powers vested in them.
18. Describe the system of indicators that determines the anthropogenic impact of pollutants on the environment.
19. Explain the principles and methodology underlying environmental impact assessment.
20. Explain what mandatory and voluntary certification is.
21. Provide the structure of the enterprise's environmental passport.
22. List the legislative acts that define the functions of local environmental management.
23. Describe the environmental audit program.
24. Explain the place of the corporate environmental management system in the overall national environmental management system.
25. Name the goals and features of assessing the environmental characteristics and life cycle of products.
26. Describe the goals and features of environmental certification and labeling.
27. Explain the principles of greening a production system.
28. Explain how environmental marketing and engineering affect the efficiency of a corporation's investment activities.
29. List the legislative acts that define the functions of local environmental management.
30. Name the forms of public participation in environmental protection.
31. Explain how economic losses from environmental pollution are determined.
32. Define actual, potential, and avoidable damages.
33. Describe the categories of payments for environmental pollution.

34. *Provide a scheme for calculating payments for emissions of pollutants into the atmosphere by mobile sources of pollution.*
35. *Compare the schemes for calculating payments for emissions of pollutants into the atmosphere by stationary and mobile sources of pollution.*
36. *Explain how the amounts of payments for discharges of pollutants into surface waters, territorial and inland sea waters, and groundwater are determined.*
37. *Explain how the amounts of payments for the placement of waste in the natural environment are determined.*
38. *Explain what the overall ecological effect of environmental protection measures is.*
39. *Describe the socio-economic outcome of environmental protection measures.*
40. *Compare the actual and expected net economic effect. Explain how they are determined.*
41. *Define the concept of overall economic efficiency. Explain the difference between the concepts of "effect" and "efficiency".*
42. *Explain what characterizes the indicator of comparative economic efficiency of environmental protection expenditures.*
43. *Describe the system of incentive measures in the environmental protection system.*

### SET OF TASKS FOR THE RGR

The purpose of the calculation and graphic work is to consolidate and deepen the knowledge obtained during lectures and practical classes related to the study of aspects of managing the implementation of environmental projects in order to increase the effectiveness of environmental protection activities.

Calculation and graphic work is performed on the basis of an individual assignment for a higher education applicant.

The RGR is drawn up in the form of a calculation and explanatory note of 12–17 pages, which contains: calculation tasks; table of contents; introduction; calculation part; conclusions; list of references; appendices (if necessary).

Task. Calculate the economic efficiency of an environmental project for the re-profiling (modernization) of one of the workshops of an enterprise (industrial or municipal) for the production of building materials, fuel composition with the extraction of metals, using some industrial and municipal solid waste. The cost of waste (raw materials for processing) is equal to 40 UAH/t. Variants of the initial data for the calculation and graphic work for calculating the economic efficiency of the project and its indicators are given in the table.

Option	Amount of waste, t/day	Cost of equipment, thousand UAH.		
		liquidated	used	installed
1	49	150.8	454.5	910.1
2	53	189.8	577.3	867.2
3	35	190.5	473.4	814.5
4	53	183.4	603.1	975.3
5	51	163.8	501.5	819.6
6	30	195.9	505.7	991.9
7	36	136.3	532.6	852
8	41	119.7	585.2	847.1
9	37	188.6	437.1	887.7
10	34	124.1	411.7	902.8
11	46	115.6	537.6	904.2
12	36	103.8	469.3	839.9
13	46	140.7	501.8	949
14	43	165.6	402.9	982.8
15	34	145.1	477.1	894.5
16	44	147.2	474.9	930.5
17	33	195.1	548.4	822.9
18	36	163.2	570.1	868.6
19	48	166.6	579.6	970.4
20	40	118.4	416.8	931.7
21	48	109.4	533.5	914.8
22	43	105.3	593.9	908.3
23	54	162.3	441.8	958.3
24	42	137.5	554.2	883.8
25	45	142.2	502.5	945.6
26	43	167.2	454.9	930.7
27	39	185.1	538.4	842.9
28	37	163.2	550.1	868.6
29	43	136.6	559.8	960.7
30	49	118.4	426.8	941.7
31	47	129.4	543.3	917.4
32	42	108.3	573.9	938.3
33	55	172.3	545.8	968.5
34	46	167.5	564.1	983.9
35	45	128.2	522.5	955.5

***The work program of the educational component (syllabus):***

***Compiled by*** Assoc. Prof., Doctor of Engineering, Trus I.M.

***Approved*** by the Department of E and TRP (No. 17 dated 05/29/2025)

***Approved*** by the IHF Methodological Commission (No. 11 dated 06/27/2025)