

**Educational Establishment**

**«The Grodno State Agrarian University»**

**APPROVED BY**

Rector of the Educational Establishment

«The Grodno State Agrarian University»

\_\_\_\_\_ V.K.Pestis

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Registration № УД-\_\_\_\_\_

**Environmental economics**  
**The curriculum of higher education institutions**  
**discipline for the specialty:**

1-25 01 04 «Finance and credit»

The curriculum is compiled on the basis of the educational standard of the first stage of higher education OSVO 1-25 80 01 – 2020 in the specialty 1-25 01 04 «Finance and credit»

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## 1.EXPLANATORY NOTE

### 1.1 Goals and objectives of the discipline

The forming of the complex and harmonious system of environmental usage which would provide conditions of stable development of the republic of Belarus with environmental saving and recovery is an important challenge facing economists, scholars and practitioners. This problem's solving requires basic ecological, economics and environmental management knowledge of all economic profile specialists, thus studying in higher education they have to get systemized knowledge of social economic sphere and environmental cooperation, problems of this cooperation and the mechanism of their solution.

The *aim* of the course is the forming of the students' ecological world outlook, the idea of evolution and the knowledge of modern ecologic management's condition, introducing methodological basis of general ecology and methodological instruments of environmental management; getting skills of ecological economic analyzing; mastering of methods on basic ecological economic indexes defining.

This course program provides studying of general ecology theoretical basis, forming and function peculiarities of constitutional environmental basis in conditions of market economics building. Thus great attention is paid to the ecological law research, regularity and environmental principles, as well as consequences of anthropogenic influence on the ecological systems, economic grounding for the nature protection activity in different economic sectors of the republic.

As the result of the studying the student must *know* :

- main instruments of the state ecological policy of the republic of Belarus;
- methodological basis of general ecology and environmental management, methods of basic ecological economic indexes defining necessary for taking optimal economic and environmental decisions;
- economic mechanism of the environmental protection and environmental usage.

The student must *be able to*:

- make ecological economic analyses using earned methods and calculate the necessary economic indexes of the environmental anthropogenic influence, social economic effectiveness of the ecological expenses and etc.
- use the acquired knowledge and skills in future practical activities in order to ensure the implementation of social economics development ecologization problems facing society.

Mastering the discipline is based on competencies acquired earlier in the study of the disciplines of "Marketing", "Economics of organizations (enterprises)", "Economics of environmental management". The knowledge and skills generated by this academic discipline are necessary for studying the following disciplines of the master's program - innovative development of an enterprise (organization), data mining technology, and are also the basis for effective research practice and preparation for final certification.

According to the educational standard of the specialty 1-26 02 02 07 "Management", in the course of mastering the curriculum, students must acquire the following academic competencies:

AK-1. To be able to apply basic scientific and theoretical knowledge to solve theoretical and practical problems.

AK-2. Own systemic and comparative analysis.

AK-3. Own research skills.

AK-6. Have an interdisciplinary approach to solving problems.

AK-7. Have skills related to the use of technical devices, information management and working with a computer.

AK-9. To be able to learn, improve their skills throughout life.

The study of academic discipline also contributes to the formation of social and personal competencies, in accordance with which the future specialist should:

SLK-1. Possess the qualities of citizenship.

SLK-2. Be able to social interaction.

SLK-3. Have the ability to interpersonal communications.

In the course of mastering the program of the discipline "Environmental economics", students will have professional competencies, according to which the specialist is able to:

PK-6. Put into practice the basic principles of modern schools and theories of the national economy, identify problems of an economic nature and propose ways to solve them, evaluate the expected results.

PK-13. To apply the basic methods for assessing forecasts and targeted programs of socio-economic and scientific-technical development, rational use of natural resources and efficient use of resource potential.

PK-14. To justify and develop anti-crisis and information-analytical programs in order to make rational managerial decisions on the main problems of socio-economic development.

The implementation of the knowledge and skills acquired by students in the study of the discipline "Environmental economics" in their further scientific and practical activities will contribute to solving the problems facing the society of greening socio-economic development.

*The structure of the content of the discipline*

***In accordance with the curriculum for the study of the discipline allocated:***

for 2 course, the form of study is full-time, I semester  
total 52 hours, of which: classroom teaching 48 hours (lectures - 30 hours,  
practical classes - 18 hours. testing works- lectures - 2 hours, practical - 2  
hours);

РЕПОЗИТОРИЙ ГТАУ

## CONTENTS OF THE EDUCATIONAL MATERIAL

### 1 THEORETICAL FOUNDATIONS OF ENVIRONMENTAL ECONOMICS

#### 1.1 Subject, methodology and the cause tasks

##### Lectures

Environmental management as the main object of study of the discipline "Environmental economics". The scientific category is "environmental management" in the broad and narrow meaning of the concept. General and special nature management. Rational and irrational nature management. Correlation of the concepts of "rational nature management" and "environmental protection". Tasks of natural resources use as a multifunctional sphere of activity.

Strengthening of the natural factor's roles of the economic development and the appearance of the new economic science branch - environmental economics. Stages of the science formation. Role of the classical economic school representatives and the representatives of the neoclassical economic theory in the formation of the environmental economics. The researches and reports of Roman Club. Three stages of the domestic environmental economics development and their content. Contribution of T.S.Hachaturova, the academician, to the environmental economics formation as a science.

Environmental and economic relations - the subject of academic discipline. The study of environmental and economic processes in their unity, contradiction and historical development as the main paradigm of academic discipline. Ecological and economic systems are a fundamental category of academic discipline.

The methodological foundations of the discipline and methods of environmental and economic research. The relationship of academic discipline with natural and technical, general scientific and special economic disciplines.

Functions and tasks of environmental economics. New areas of environmental and economic research to advance along the path of sustainable development and implementation of the principles of a green economy. The place and tasks of the discipline in the system of training specialists of economic profile and the formation of environmental and economic thinking. The worldview and didactic significance of the discipline.

#### 1.2. Features of the interaction of society and the environment

##### Lectures

The doctrine of V.I.Vernadskiy about biosphere as a component of the modern ecology. The structure of the biosphere and its properties. Biogeochemical cycles (geological and biotic circulation of the substance) and their role in the stable biosphere ensuring. The human intervention into the nature circulation and its consequences. The concept of biological accumulation.

The doctrine of noosphere. V.I.Vernadskiy's contribution into the development of ideas about noosphere. Common regularities and principles of human and nature cooperation. Main ecological laws and principles (according to B.Commoner and N.F.Reymers). The essence of new biosphere ideology.

The history of the ecology appearance and development. Views of E.Haeckel. Emergence of the ecological schools. Main concepts and views of ecology. The concept of the ecologi-

cal fact. Abiotic, biotic and anthropogenic facts and their cooperation.

Levels of the living creatures organization (populations, associations, ecosystems). Population, its structure and dynamics.

The concept of ecosystems. The doctrine of biocenosis. Ecosystems' energetics and their productiveness. The synthesis of primary organic substance. Trophic chains (producers-consumers- decomposers). Autotrophs and heterotrophs. Ecological pyramids. Stable ecosystems (Le Chatelier's principle). The doctrine of V.I.Vernadskiy about biosphere as a component of the modern ecology. The structure of the biosphere and its properties. Biogeochemical cycles (geological and biotic circulation of the substance) and their role in the stable biosphere ensuring. The human intervention into the nature circulation and its consequences. The concept of biological accumulation.

The concept of environmental management as the totality of all forms of anthropogenic impact on the natural environment. Laws and principles of nature management. Three historical stages of environmental and economic development: frontal economy; economic development taking into account environmental protection; sustainable development. Economic, ecological-economic and socio-ecological principles of nature management.

Strengthening anthropogenic impacts and their consequences. Features of the technogenic type of economic development.

Ecological problems of industrialization. The increase in environmental pollution and the depletion of natural resources as a result of the growth of industrial production. Ecological consequences of intensification and expansion of agricultural production. Transport and its impact on the environment. Urbanization and ecology. The growth of industrial and municipal waste in cities, air pollution.

Problems of environmental management in the transition to a market economy. Common features of the modern environmental crisis. The nature of the impact of market relations on the environmental sphere. A new type of environmental and economic interaction is sustainable development.

#### Seminars

Familiarization with the periodization of the interactions between society and nature, depending on the level of development of productive forces; laws and principles of nature management; the consequences of increased anthropogenic impacts on the environment using known factors.

### **1.3. Natural factors of development and their economic assessment**

#### Lectures

Ecological economics needs and interests. Connections and contradictions between economics and environment. Ecological security as the urgent need of the mankind. Economic environmental functions.

Environmental quality as a consumer good. Methods for determining of the optimal environmental quality. Responsibility distribution for the environmental safekeeping. External species. Outer ecological affects and their internationalization. Social costs accounting. Realization of the "polluter pays" rule. "Victim pays" rule.

State and market in the ecological sphere. Causes of state "ineffectiveness" in the environmental protection. Market "failure" and its origin. Problem of the property rule in the environ-

ment. Property objects and subjects. Types of nature resource properties (ownership, use, disposal). Economic realization forms for the nature resource's ownership.

Macroeconomic policy and ecological factor. Industry context of the environment pollution. Ecostructuring problems and problems of production upgrading. Ecological and nature resource parameters for the macroeconomic decisions. Arrangements of the ecology control.

Economy essence of the "nature conditions" and "nature resources" concepts. Nature resources classification: natural, economic, ecological (on the depletion feature), "market".

Nature conditions and resources as a factor of productive forces' development and placement. Nature factors as means of labor, labor subjects and man's living conditions. Limiting influence of the nature resources on the economic growth in modern conditions. "Nature fund" concept. Natural resource's component of the national wealth. Nature factors' influence on the production effectiveness, its territorial organization and region specification.

Nature resources' potential and its meaning in the expanded production. Ways of nature resources potential's territory definition. Overall rating of Belarus nature fund. Changes in environment property relations and its economic value. Nature resources and the market. Methodological features of the economic assessment of ecosystem services of forests and wetlands.

The economic valuation of natural wealth is the basis of the paid nature and formation of market relations in nature management. The market mechanism "debts for nature" as a tool for financing large-scale environmental programs.

#### Seminars

Determining the place and role of environmental management economies in the national economy, identifying relevant environmental problems in the functioning of the agro-industrial complex.

#### Practical lessons

The study of the differences in the concepts of "natural conditions" and "natural resources", the classification of natural resources; theoretical foundations and methods of economic assessment of natural resources based on rental and cost approaches; solving problems to determine the economic valuation of natural resources.

## **2. INSTITUTIONAL MECHANISMS OF NATURAL USE REGULATION**

### **2.1. Environmental Management and Legal Protection of the Natural Environment**

#### Lectures

Concept of "state environmental control". Main components of the control's mechanisms: methods, functions, organization structures. Executive environmental control. Increasing role of the economic management methods on the stage of transition to the market economics.

Organization control structures. Department and territorial principals of environmental management and organization structures actualizing them.

Powers of the President, Council of Ministers, National Assembly of the Republic of Belarus in the field of environmental protection. The Ministry of Natural Resources and Environmental Protection of the Republic of Belarus, its tasks, functions, structure. Responsibility and tasks of other state and local authorities to rationalize nature management.

Ecological and nature resources law is the base for the ecological sphere regulating. Backgrounds for the nature surroundings law protection. Formation of the modern law system of nature usage regulation.



Legislation of the Republic of Belarus and other law acts on the questions of effective usage and nature wealth protection. The constitution of the Republic of Belarus and legislative acts on the environment protection, specially protected nature territories, hydrometeorological work, ozone layer protection, state ecological inspection, industrial and consumer waists, sanitary-epidemiologic well-being and many others. Land, water, forest law, law of the Republic of Belarus about bowels of the Earth, vegetal and animal world. Forming of the market model in the economics and the evolution of the ecologic law in independent Belarus at the turn of the century.

Responsibility for the environmental law breaking. Disciplinary, administrative and criminal kinds of responsibility. Compensation for the environmental harm. Administrative, criminal and civil legal codes according to the ecologic demands. Creation of the ecological law-enforcement authorities in Belarus.

Foreign ecological law.

Seminars

Studying the fundamentals of state environmental management, administrative, economic, socio-psychological management methods, management principles, organizational structures, legal acts.

## **2.2. Rationing and standardization; monitoring, accounting and control in the field of environmental management and environmental protection**

Lectures

Main requirements to the working-out of the environmental standards. Principals of ecological standardization.

Standard environmental qualities. Standard ultimate admissible concentration (UAC) of the chemical and other substances. Standard ultimate admissible concentration of microorganisms. Standard ultimate admissible physical effects.

Standard ultimate admissible effects on the environment: standards ultimate admissible emissions and dumping of chemical and other substances; standards of industrial waste formation.

Essence and tasks of the environmental monitoring. Kinds of environmental monitoring. Observing system of the environment conditions in Belarus, its formation. National system of the environmental monitoring and its tasks.

Accounting and analyzing in the nature protection work. Nature resources cadastre. Economical statistical accounting of the environmental and nature protection activity.

Bases of the ecological standards. Technological, technical, hygienic standard indexes. Standards of UAC and UAE.

Ecological auditing. Ecological inspection and control.

Practical lessons

The study of basic environmental standards, environmental statistics; determination of environmental quality using MPC indicators; MPE; norms of green zones, etc. Study of the nature and types of environmental monitoring; contents of environmental audit, environmental impact assessment and control.

## **2.3. Environmental management at the enterprise (in the organization)**

Lectures

Environmental activity and environmental complex of the enterprise. Environmental per-

formance assessment indicators: natural, resource consumption, technical and technological, environmental and economic.

Planning environmental activities of the enterprise. The content of the plan of the enterprise for environmental protection and rational use of natural resources. Environmental and resource-saving activities in the business plan of the enterprise. The company's environmental strategy.

Environmental management of the enterprise: the main aspects and features of the organization. Environmental policy is an important element of the environmental management system. The effectiveness of environmental management.

Environmental audit. Objects, goals and objectives of the environmental audit. The regulatory framework of environmental audit. External and internal eco-audit. The listening procedure and its effectiveness.

Environmental licensing and certification. Licensed activities in the field of environmental management. The purpose and procedure for environmental licensing in Belarus.

Ecological passport of the enterprise as a tool for environmental management.

Practical lessons

Draw up an environmental passport of the enterprise (organization).

### **3. ECONOMIC ENVIRONMENTAL VALUES**

#### **3.1. Economic value of the harm after the anthropogenic environmental influence**

Lectures

Concept, content and kinds of damages from pollution and environment exhaustion. Ecological, economic and social damages. Economic exhaustion value. Method of direct account. Analytic method. Empirical (enlarged) method. The essence of the social damages from negative environment influences. Filled and unfilled social loss.

Total prevented ecological economic damage and the possibility of its determination. Main methodological approaches to the economic value for the damage of air, water, land pollution, for the biological resources damage, influence of the physical factors and its damage.

Usage directions of the ecological economic damage indexes for the ecobalanced policy realization during taking the economic decisions.

Experience in economic damage values from the environment polluting of Belarus.

Practical lessons

Familiarization with the content and types of damage from pollution and depletion of the environment; methodology for determining the environmental, economic and social damage.

#### **3.2. Nature protection costs**

Lectures

Consist of the nature protection events and principles of their justification. Economic essence of the nature protection costs: prevention expenses and economic loss. Ecological optimum of environment pollution. The structure of investments to the environment protection.

Investments to the fixed capital (capital costs) and operating expenses (current costs) of the ecological purpose. Use directions of the nature protection investments. Main industrial nature protection funds. Volume of the capital investments and evaluation of their using.

Consist of operating ecological expenses. Calculating method of their finding.

Internal and external ecological expenses. The problem of “internationalization” of the external expenses. Assimilative potential of nature and the task of its evaluating.

Investments of the nature protection work in Belarus. Forms and kinds of nature protection work (according to “Classifier of kinds of nature protection work and nature protection costs”). Analyzing of capital and current costs of the nature protection in the Republic of Belarus, evaluation of their effectiveness. Correlation of total economic loss from environment pollution and costs of ecological purposes.

Practical lessons

Analysis of environmental costs.

### **3.3. Cost-effectiveness of environmental activities**

Lectures

Economic effectiveness of nature protection events: the essence, indexes and methodological peculiarities of the definition. Economic effectiveness as correlation of ecological costs and results (profits) of the nature protection work. Economic effectiveness and the result of holding nature protection events. Defining methods of economic effectiveness indexes. Usage of discounting coefficient for the time factor integration.

Index of comparative economic effectiveness of nature protection costs for the choice justification of preferable ecological event. Analysis of “costs- effectiveness”.

Social effectiveness of nature protection events: essence and peculiarities of the measuring.

Practical lessons

Familiarization with the content and types of effectiveness of environmental protection measures; methodology for determining economic and social efficiency.

## **4. ECONOMIC MECHANISM OF ENVIRONMENT PROTECTION AND ENVIRONMENTAL USAGE**

### **4.1. Economic stimulating of rational environment usage and nature protection activity**

Lectures

Economic stimulating of rational environment usage and nature protection activity. Forming of the system of events financing and the program of protection and nature resources reproduction. Main sources and kinds of nature protection events’ financing. Stage budget role in the financing of nature protection activities.

Ecological activities financing at the enterprises, in the incorporations and in firms. Investment activities of economic management subjects. Targeted budget fund for the nature protection in the Republic of Belarus, its purpose and sources of forming. Increasing importance of the budget fund for the nature protection in the financial provision of the nature protection activities.

New approaches to the nature protection events financing. Ecologization of budget tax and financial credits policy. Tax exemptions and credits in nature protection activities. Ecological loans.

Ecological insurance: essence, kinds and forms. The problem of harm compensation as a result of environment harm influence. Insurance funds as the extra financial sources of ecologic activities.

Potential financial sources of nature protection activities according to the foreign expe-

rience. Ecological leasing as a kind of long-term crediting. Paid tourist services.

#### Seminars

Acquaintance with the methodology for determining macroeconomic and production indicators, taking into account the environmental factor; features of financing environmental protection measures.

#### Practical lessons

Acquisition of skills to determine the environmental and land tax of the enterprise.

### **4.2. Formation of market institutions of environmental and economic regulation**

#### Lectures

Ownership problems in the environment usage and the experience in their solving in the economically developed countries. Ecological aspects of privatization.

Free enterprises and ecological services and jobs market development. Possible ecological consequences of the enterprises activities. The necessity of ecological enterprises state support. Foreign experience in economic stimulating of ecological enterprises with budget tax and finance credits policy. Analyzing of the world ecologic market efficiency. Main developing directions of ecological enterprises in the spheres of goods production, services, financial credits activities. Evaluation of the possibilities in ecological work and services market forming in Belarus.

Insurance services market development in the sphere of environment usage and environment protection. Market mechanism of environment protection control.

#### Seminars

Acquaintance with the content and types of the main market institutions of the environmental sphere, the role of entrepreneurship in the formation of the market of environmental works and services.

## **5. GREEN ECONOMY FOR SOLVING ECOLOGICAL PROBLEMS OF CIVILIZATION**

### **5.1. Climate change, the destruction of the ozone layer of the Earth and the problems of ensuring the quality of the air basin**

#### Lectures

The concept of "airspace". Atmosphere, its composition. Ecological particular qualities of the airspace. Main sources and kinds of pollution. Hygienic, economic, social consequences of the air pollution. Damage accounting of the airspace pollution.

Quality regulation and airspace conditions monitoring. Main routes in the atmosphere protection (hygienic, technological, control and restraining steps, planning activities). Ways of industrial ejections cleaning in the atmosphere.

Global warming: the main causes and consequences. The UN Framework Convention on Climate Change (UNFCCC, 1992), the Kyoto Protocol to the UNFCCC (1997), the Paris Climate Agreement (2015) are global instruments for protecting the planet's climate system.

The destruction of the ozone layer of the Earth and the efforts of the world community to ensure its safety. Vienna Convention for the Protection of the Ozone Layer (1985) and Montreal Protocol on Substances that Deplete the Ozone Layer (1987), their effectiveness.

Regulations of the airspace conditions: law and normative acts, the system of the economic stimulating of the air protection in the Republic of Belarus.

#### Practical lessons

The study of the main sources, types and effects of air pollution; main areas of atmospheric protection; regulation of the state of the air in the Republic of Belarus. Acquisition of practical skills in calculating environmental emissions.

### **5.2. Ecological economic aspects of the water resources use and protection**

#### Lectures

Water resources as an ecology factor of the Earth's life. Water as a factor of productive forces development. Water resources of the world and CIS countries. Water resource assessment of the Republic of Belarus.

Main routes in the water facilities using. Concept of water resources and its structure. Water consumption and water management. Wastewater, its dynamic tendencies. Water resources' balances.

Inner water and sea pollution, sources and types of pollution, their consequences. Evaluation and norms of water quality.

Main routes in protecting and sensible water usage. Water cadastre. Methods of cleaning waste waters. The system of reserve waters and re-serial water use in industry. Generalized index of the effectiveness in the water resource's use. Law and economic regulation of the water protection and national water usage in the Republic of Belarus.

#### Practical lessons

Acquisition of practical skills to assess the level of pollution of water bodies (sources and types); state and regulation of water quality.

### **5.3. Environmental issues of land use and land conservation**

#### Lectures

Land as means of production and special base of the society development. Land resources of the world and CIS countries. Land fund of the Republic of Belarus. Land fertility. Factors and kinds of fertilities. Natural, artificial and economic fertility. Unfavorable consequences of land resources using. Ecological condition of the land and soil surface. Water and wind land erosion. Land pollution with chemical substances. Radioactive land pollution after Chernobyl disaster and its consequences. Industrial and consumption wastes accumulation.

Main routes in recovery and land protecting. Recultivation and its effectiveness. Land melioration. Land protection from pollution. Soil fertility production and agricultural ecologization.

Land accounting and evaluation. Modern land planning. State land cadastre: its structure, content and conducting. Cadastre evaluation of agricultural lands. Inhabited locality land evaluation.

Law norms and economic regulation of the national land usage. State land policy of the Republic of Belarus. Land law development. The law of the Republic of Belarus "About the land ownership" and reforms in land relationship. Economic stimulating of the protection and effective land use.

#### Practical lessons

Acquisition of accounting skills and determination of economic valuation of land resources.

### **5.4. Problems of rational use of forest resources and conservation of**

## **biological diversity**

### Lectures

Ecological economic value of forests and other biological resources. Forest ecosystems' peculiarities. Forest fund of the world and CIS, its condition and the usage routs. Concept "forest resources". Reduction of the forestland and its consequences.

Plants world of Belarus. Structure of the forest fund. Species and age forest ranges in Belarus. Forests of the 1st and the 2nd groups. Non-timber forest resources.

Peculiarities of forest usage and forest reproduction. Kinds of forest usage. Rated cutting area. Rational forest usage. Effectiveness of the forest reproduction measures.

Complex use of the forest resources and forests protection.

Biological variety on the territory of Belarus and its value. Animal world evaluation of the republic. Reservation measures and their role in biological variety safekeeping. Specially protected nature territories of Belarus and their functions: reserves, national parks, wildlife sanctuary.

Economic stimulating of the rational forest usage. Law control protection and rational usage of forest resources of the Republic of Belarus.

### Practical lessons

Gaining skills to determine the economic efficiency of forest exploitation and reforestation.

## **5.5. Rational use of subsoil resources**

### Lectures

The role of mineral resources in the manufacturing process. Common characteristics of the mineral wealth and peculiarities of their allocation. Useful minerals' classification.

Mineral wealth evaluation of the Republic of Belarus. Fuel-energy resources. Mineral and chemical raw materials. Ferrous metals and non-ferrous metals. Raw materials for the building production. Mineral ground water.

Main routes of the rational usage and subsoil protection in the Republic of Belarus. Depletion of subsoil resources and the necessity of their complex usage.

### Practical lessons

Gaining skills in determining the economic valuation of mineral resources of the Republic of Belarus.

## **5.6. Sustainable development and the green economy: conceptual framework and prospects for the Republic of Belarus**

### Lectures

The essence and main stages of the formation of the concept of sustainable development. The United Nations Conference on the Environment in Stockholm (1972) and its importance for the formation of a model of ecologically oriented development. The main provisions of the concept of sustainable development set forth in the Report "Our Common Future" (1987) of the UN International Commission on Environment and Development (ICCD). The United Nations Conference on Environment and Development in Rio de Janeiro (1992) is a landmark event in shaping the global sustainable development strategy. The global action plan outlined in the outcome documents, the Rio Declaration and Agenda 21.

The World Summit on Sustainable Development in Johannesburg (2002) is a new step in strengthening the strategy for sustainable human development. Johannesburg Memorandum. The

UN Conference “RIO + 20” (2012) is a confirmation of the political commitment of the world community to a new development model. RIO + 20 Outcome Document “The Future We Want” about the challenges of humanity in creating a “green economy” in the context of sustainable development and the eradication of poverty on the planet.

New York Summit on Sustainable Development as part of the 70th anniversary of the UN General Assembly (2015). Summit Outcome Document. “Transforming our world: the 2030 Agenda for Sustainable Development” (2015) is an important milestone on the path to global sustainability and green development.

Basic principles of a green economy. Global prospects and the effectiveness of the implementation of the concept of a green economy. Effective tools for a green economy: eco-innovation, eco-labeling, eco-design, energy efficiency, organic agriculture.

Environmental threats and barriers to sustainable development of the Republic of Belarus. External and internal environmental threats. Prospects for moving the Republic of Belarus towards a green economy.

The National Action Plan for the Development of the Green Economy in the Republic of Belarus (NAP) to address environmental issues.

Priority areas of the green economy: development of electric transport and urban mobility; implementation of the concept of “smart” cities; development of construction of energy-efficient residential buildings and increase of energy efficiency of the housing stock; reduction in energy intensity of GDP, increase in energy efficiency; increasing the potential for the use of renewable energy sources; creation of conditions for the production of organic products; sustainable consumption and production; development of ecological tourism.

Criteria and indicators for assessing the conformity of economic activity with the principles of a green economy.

Practical lessons

Skills in calculating energy consumption and energy efficiency; study of the conditions for the production of organic products, the development of eco-tourism.

## **5.7. International cooperation in the sphere of nature protection**

Lectures

Stages of the international ecological cooperation system’s forming. Law, social economic, finance, technological, political, organizing, informative aspects of the cooperation. Main directions of the international cooperation in the sphere of nature protection: parliamentary, inter-governmental, scientific and technological cooperation, convention regulating, public organizations’ cooperation. International agreements, conventions, pacts, programs, organizations.

Ecological activity of UN and its special departments.

UN conference on the environment (year 1972, Stockholm) and its importance. UN program on the environment (UNEP). WCED report (Brutland committee) “Our global future” (year 1987) and the concept of stable human development as new civilization model in the XXI century.

UN conference on the environment and development (year 1992, Rio-de-Janeiro) was the most important event in the international ecological cooperation. Global action plan represented in the final documents “Rio declaration” and “XXI century’s agenda”. World summit on the stable development (year 2002, Johannesburg) was a new step in the strengthening of the strategy of stable human development. Johannesburg’s memorandum.

International finance organizations' contribution (World bank, International currency fund, European bank for reconstruction and development) in the realization of world community ecological programs.

Participation of the republic of Belarus in international ecological cooperation. Signing of conventions and protocols, participation in the work of intergovernmental organizations on the environmental problems, double sides cooperation with particular countries, working-out of the international projects and programs and others.

#### Seminars

Familiarization with information on the modern system of environmental cooperation, major international treaties and other agreements in the field of conservation of the planet's natural environment.

РЕПОЗИТОРІЙ ГТАУ





1.2.2	General laws and principles of the interaction of human society with the natural environment.								
1.2.3	Periodization of the interactions of nature and society, depending on the level of material production.								
1.2.4	The concept of environmental management as a combination of all forms of anthropogenic impact on the environment. Laws and principles of nature management.								
<b>1.3</b>	<b>Natural factors of development and their economic assessment</b>	<b>8</b>	<b>2</b>	<b>2</b>		<b>4</b>	The computer presentation №3	[1] [3]	Oral poll Solution of tasks.
1.3.1	Ecological economics needs and interests. The economic essence of the concepts of "natural conditions" and "natural resources"								
1.3.2	Classification of Natural Resources								
1.3.3.	Natural resource potential of the Republic of Belarus								
1.3.4	Economic assessment of natural resources: concept, functions, tasks, methods of determination								
<b>2</b>	<b>INSTITUTIONAL MECHANISMS OF NATURAL USE REGULATION</b>								
<b>2.1.</b>	<b>Environmental Management and Legal Protection of the Natural Environment</b>	<b>8</b>	<b>1</b>	<b>1</b>		<b>6</b>	The computer presentation №4	[11] [12] [16]	Oral poll, preparation of papers on a subject
2.1.1.	The concept of "state environmental management." Functions and methods of UP								
2.1.2	Organization control structures on a territorial and sectoral basis								
<b>2.2.</b>	<b>Rationing and standardization; monitoring, accounting and control in the field of environmental management and environmental protection</b>	<b>8</b>	<b>1</b>	<b>1</b>		<b>6</b>	The computer presentation №5	[4] [11] [12]	Oral poll, preparation of papers on a subject

2.2.1.	Basics of environmental regulation								
2.2.2.	Standardization in the field of environmental protection.								
2.2.3	Environmental certification								
2.2.4	The nature, objectives and types of environmental monitoring Environmental control, examination and audit								
<b>2.3.</b>	<b>Environmental management at the enterprise (in the organization)</b>	<b>8</b>	<b>1</b>	<b>1</b>		<b>6</b>	The computer presentation №6	[4] [11] [12]	Oral poll. Discussion of problematic issues. Solution of tasks
2.3.1.	Environmental activities of the enterprise: assessment indicators and planning.								
2.3.2.	Environmental management of the enterprise. Environmental audit.								
2.3.3	Environmental licensing and certification. Environmental passport of the enterprise								
<b>3</b>	<b>ECONOMIC ENVIRONMENTAL VALUES</b>								
<b>3.1.</b>	<b>Economic values of the harm after the anthropogenic environmental influence</b>	<b>8</b>	<b>2</b>	<b>2</b>	<b>2/-</b>	<b>2</b>	The computer presentation №7	[1] [2] [6]	Written poll on a subject, preparation of papers, performance of a practical task
3.1.1.	Concept, content and kinds of damages from pollution and environment exhaustion.								
3.1.2.	Main methodological approaches to the economic value for the damage								
<b>3.2</b>	<b>Nature protection costs</b>	<b>8</b>	<b>2</b>	<b>1</b>		<b>3</b>	The computer presentation №8	[1] [2] [6]	Oral poll, papers on a subject, performance and protection of a practical task
3.2.1.	Economic essence of the nature protection costs: prevention expenses and economic loss.						Methodical indications of chair. Annual reports	[1] [2] [6]	Written poll, papers on a subject, performance and protection of a practical task

3.2.2.	Economic and social effectiveness of nature protection events								
<b>3.3</b>	<b>Cost-effectiveness of environmental activities</b>	<b>8</b>	<b>1</b>			<b>5</b>	The computer presentation № 9	[1] [2] [6]	Oral poll on a subject, preparation of papers
3.3.1.	Cost-effectiveness of environmental measures						Methodical indications of chair. Annual reports	[1] [2] [6]	Oral poll on a subject, preparation of papers
3.3.2.	Social Efficiency of Environmental Measures								
<b>4.</b>	<b>ECONOMIC MECHANISM OF ENVIRONMENT PROTECTION AND ENVIRONMENTAL USAGE</b>								
<b>4.1</b>	<b>Economic stimulating of rational environment usage and nature protection activity</b>	<b>8</b>	<b>2</b>	<b>1</b>		<b>3</b>	The computer presentation №10	[6]	Oral poll on a subject, preparation of papers
4.1.1	The essence and measures of economic incentives for environmental protection.						Methodical indications of chair.		
4.1.2	Foreign experience in environmental and economic regulation								
<b>4.2.</b>	<b>Formation of market institutions of environmental and economic regulation</b>	<b>8</b>	<b>2</b>			<b>4</b>	The computer presentation № 11	[11] [12] [16]	Oral poll, preparation of papers on a subject
4.2.1	Environmental aspects of property relations								
4.2.2	Environmental Services Market: Essence, Functions, Foreign Experience								
4.2.3	Environmental insurance: essence, types, forms								
<b>5.</b>	<b>GREEN ECONOMY FOR SOLVING ECOLOGICAL PROBLEMS OF CIVILIZATION</b>								
<b>5.1</b>	<b>Climate change, the destruction of the ozone layer of the Earth and the problems of ensuring the quality of the air basin</b>	<b>8</b>	<b>1</b>	<b>2</b>		<b>3</b>	The computer presentation № 12	[4] [11] [12]	Oral poll, preparation of papers on a subject
5.1.1	Ecological particular qualities of the airspace.								

	Main sources and kinds of pollution								
5.1.2	Main routes in the atmosphere protection. Ways of industrial ejections cleaning in the atmosphere.								
5.1.3	Regulations of the airspace conditions								
<b>5.2</b>	<b>Ecological economic aspects of the water resources use and protection</b>	<b>8</b>	<b>1</b>	<b>2</b>		<b>3</b>	The computer presentation №13	[4] [11] [12]	Oral poll. Discussion of problematic issues. Solution of tasks
5.2.1	Ecological and economic importance of water resources.								
5.2.2.	Water resources of the world and Belarus								
5.2.3	The concept of water management, its structure. Water consumption and water use								
5.2.4	Types and sources of water pollution, its consequences The main directions of water protection. Legal and economic regulation of protection and rational water use								
<b>5.3</b>	<b>Environmental issues of land use and land conservation</b>	<b>8</b>	<b>1</b>	<b>1</b>		<b>4</b>	The computer presentation № 14	[4] [11] [12]	Oral poll Solution of tasks.
5.3.1	Land as a means of production and the basis for the development of society. Land resources of the world and the Republic of Belarus								
5.3.2.	Causes of land loss and decline in fertility.								
5.3.3	Normative legal and economic regulation of rational land use								
<b>5.4.</b>	<b>Problems of rational use of forest resources and conservation of biological diversity</b>	<b>8</b>	<b>2</b>	<b>1</b>		<b>3</b>	The computer presentation № 15	[4] [11] [12]	Oral poll on a subject, performance of a practical task
5.4.1	Ecological and economic importance of forest resources. Forest resources and biological diversity of the Republic of Belarus						Methodical indications of chair. Annual reports		
5.4.2	Problems of rational use, protection and repro-								

	duction of forest and other biological resources								
5.4.3	Protected areas and objects in the world and the Republic of Belarus								
<b>5.5.</b>	<b>Rational use of subsoil resources</b>	<b>8</b>	<b>1</b>	<b>1</b>		<b>4</b>	The computer presentation № 16	[1] [2] [6]	Written poll on a subject, performance and check of a practical task.
5.5.1	Minerals and their classification						Methodical indications of chair. Annual reports		
5.5.2	Mineral resources of the world and their distribution between countries								
5.5.3	Assessment of the wealth of the subsoil and the Republic of Belarus								
5.5.4	The main directions of protection of the subsoil								
<b>5.6.</b>	<b>Sustainable development and the green economy: conceptual framework and prospects for the Republic of Belarus</b>	<b>8</b>	<b>2</b>		<b>-/2</b>	<b>2</b>	The computer presentation № 17	[4] [11] [12]	Testing on a subject, performance and check of a practical task. Preparation of papers
5.6.1	Sustainable development concept								
5.6.2	The concept, principles and tools of a green economy								
5.6.3	Prospects for the development of a green economy in the Republic of Belarus								
<b>5.7.</b>	<b>International cooperation in the sphere of nature protection</b>	<b>8</b>	<b>4</b>			<b>2</b>	The computer presentation № 18	[4] [11] [12]	Written poll, performance of a practical task, preparation of referat on a subject
5.7.1	Stages of the formation of a system of international environmental cooperation.						Methodical indications of chair. Annual reports		
5.7.2	Environmental Activities of the UN and its Specialized Bodies								

5.7.3	Contribution of international financial organizations to the implementation of environmental programs								
5.7.4	The participation of the Republic of Belarus in international environmental cooperation								
	<b>All hours</b>	<b>146</b>	<b>30</b>	<b>18</b>	<b>2/2</b>	<b>94</b>			

РЕПОЗИТОРИЙ ГТАУ

#### 4. INFORMATION AND METHODOLOGICAL PART

##### Normative and legislative acts

1. National legal Internet portal of the Republic of Belarus. (Electronic resource). Access mode: <http://www.pravo.by> - Access date 09/21/2018:
2. The Constitution of the Republic of Belarus in 1994 (as amended and supplemented on October 17, 2004) // National Center for Legal Information of the Republic of Belarus.
3. Water Code of the Republic of Belarus, April 30, 2014 No. 149-3. Rev. and add. : Law of the Republic of Belarus, July 17, 2017 No. 51-3.
4. The Land Code of the Republic of Belarus, July 23, 2008 No. 425-3. Rev. and add. : Law of the Republic of Belarus, October 24, 2016 No. 439-3.
5. The Code of the Republic of Belarus on bowels, July 14, 2008 No. 406-3. Rev. and add. : Law of the Republic of Belarus, July 18, 2016 No. 400-3.
6. Forest Code of the Republic of Belarus, December 24, 2015 No. 332-3.
7. On environmental protection: Law of the Republic of Belarus, November 26, 1992 No. 1982-XII. Amendment and Supplement: Law of the Republic of Belarus dated July 17, 2017 No. 51-3.
8. On the animal kingdom: Law of the Republic of Belarus, July 10, 2007 No. 257-3. Rev. and add. : Law of the Republic of Belarus dated July 18, 2016 No. 399-3.
9. On atmospheric air protection: Law of the Republic of Belarus, December 16, 2008 No. 2 – 3. Rev. and add. : Law of the Republic of Belarus dated December 24, 2015 No. 333-3.
10. On the plant world: Law of the Republic of Belarus, June 14, 2003 No. 205-3. Amendment and Supplement: Law of the Republic of Belarus dated July 18, 2016 No. 402-3.
11. On the protection of the ozone layer: Law of the Republic of Belarus, November 12, 2001 No. 56-Z. Amendment and Supplement: Law of the Republic of Belarus of June 16, 2014 No. 161-3/

#### Literature

##### Primary:

1. Bobylev, S. N. Environmental Economics: a textbook / S.N. Bo-byev, A.Sh. Khojaev. - M.: INFRA – M, 2014.
2. Lukyanchikov, I.N. Economics and environmental management: a textbook for universities - 4th ed., Revised and ext. / I.N. Lukyanchikov, I.M. In a grassy way. - M.: UNITY-DANA, 2015.
3. Shimova, O.S. Environmental Economics: Workshop / OS Shimova. - Minsk: BSEU, 2016.
4. Shimova, O.S. Environmental Economics: Textbook. allowance / 2nd ed. correct / O.S. Shimova, N.K. Sokolovsky - M. : SIC INFRA-M, 2015.
5. Shimova, O.S. Fundamentals of Ecology and Environmental Economics: Textbook / 3rd ed., Rev. and add. / O.S. Shimova, N.K. Sokolovsky - Minsk: BSEU, 2010.



6. Economics of environmental management: uch.-method. allowance / A. V. Neverov [et al.]; under the general. ed. A.V. Neverova. - Minsk: Kolorgrad, 2016.

***Additional:***

1. The national strategy for sustainable socio-economic development of the Republic of Belarus for the period until 2030 / Economy. Bulletin NIEI M-va economy Resp. Belarus. - 2015.– No. 4.

2. Neverov, A.V. Sustainable nature management: essence, conception, implementation mechanism. / A.V. Neverov, I.P. Derevyago. - Minsk: BSTU, 2005.

3. Pakhomova, N.V. Environmental Management: Textbook / N.V. Pakhomova, A. Endres, C. Richter. - St. Petersburg: Peter, 2013.

4. Titenberg, T. Environmental Economics and Environmental Protection / T. Titenberg. - M.: OLMA-PRESS, 2001.

5. Sustainable development of the Republic of Belarus on the principles of green economy: National Communication / NIIE M-va economy Rep. Belarus. - Minsk, 2012.

6. Shimova, O.S. Sustainable development: textbook / OS Shimova. - Minsk: Belarusian State Economic University, 2017.

7. Environmental audit. Theory and practice: a textbook for university students / ed. THEM. Of her. - M.: UNITA-DANA, 2013.

8. Ecology and environmental economics: Textbook for universities / Ed. E.V. Girusova - 4th ed., Revised. and ext. – M: UNITA – DANA, 2018.

9. Economics of environmental management: textbook / ed. K.V. Papenova. - M.: TEIS, TC Velby, 2019.

***Internet***

1. UN Environment Program UNEP - <http://www.unep.net>

2. The Ministry of Natural Resources and Environmental Protection - <http://www.minpriroda.gov.by/ru/>

3. The National Center for Legal Information of the Republic of Belarus - <http://www.ncpi.gov.by>

## **Guidelines for the organization of independent work of students in the discipline «Environmental economics»**

The main areas of independent work are:

- initially detailed familiarization with the curriculum;
- familiarization with the list of recommended literature on discipline in the whole and its sections, its presence in the library and other available sources, the study of the necessary literature on the topic, the selection of additional literature;
- study and expansion of the lecture material of the teacher due to special literature, consultations;
- preparation for seminar (practical) classes according to specially developed plans with the study of basic and additional literature;
- preparation for the implementation of diagnostic forms of control (tests, colloquiums, tests, etc.);
- preparation for a credit.

### **Student Competency Diagnostics**

The final assessment of students' academic achievements and knowledge is carried out in the form of a set-off based on the results of current academic performance.

Evaluative diagnostic tools should provide an assessment of the students' ability to creative activity, their willingness to search for solutions to new problems associated with the lack of generally accepted algorithms.

The following basic forms and means of assessing knowledge are used to diagnose students' competencies as a result of mastering the discipline «Environmental economics»:

1. The oral form - interviews; colloquiums; oral presentations and lectures at seminars; oral presentations at student scientific and practical conferences; score based on business games; case-based assessment.
2. Writing - tests; quizzes; test papers; essay; portfolio; abstracts; individual tasks; publication of articles, reports.
3. Written-oral form - reports on classroom or home practice assignments with their oral protection; score based on the results of a business game.
4. Technical form - computer testing; multimedia presentation of reports; development of video materials (thematic videos, problematic videos), thematic photo works.

An intermediate assessment of students' knowledge is carried out on a 10-point scale. To assess the knowledge and competence of students, criteria approved by the Ministry of Education of the Republic of Belarus are used.

## Theme of abstracts

1. The concept, features and evaluation of the economic efficiency of low-waste production
2. Foreign experience in solving environmental and economic problems
3. Economic incentives for environmental protection
4. Organization of environmental protection by the example of a specific enterprise
5. Experience in the use of production and consumption waste in the Republic of Belarus and abroad
6. Resource-saving policy - the policy of a civilized state
7. Natural, economic, environmental and financial problems of complex processing of raw materials
8. Unconventional energy sources: advances in science, problems of using and financing new developments in the Republic of Belarus and abroad.
9. Features and problems of environmental management in the Grodno region
10. Determination of the environmental risk of human activities
11. Environmental insurance in the Republic of Belarus and abroad: the current state of the problem and development prospects
12. Integrated quantitative, qualitative and social assessments of environmental safety of the implementation of measures for the development of the enterprise
13. The economic rationale for the introduction of environmental technologies (for a specific example)
14. Management of the implementation of the investment project in regional environmental management
15. Natural resources, their classification and impact on the development of human production activities. Economic valuation of natural resources
16. Payment for natural resources: types, rates, accrual procedures
17. Environmental licensing: essence, participants, financing
18. Global problems of environmental pollution
19. The structure and priorities of environmental costs in the enterprise
20. Environmental production costs. Negative and positive external effects, internalization of externalities
21. Economic damage from environmental pollution. Approaches to its definition
22. Economic damage from environmental disasters associated with any kind of natural resources of Belarus and the world (from history and modernity)
23. The mechanism and standards for the collection of payments for environmental pollution in Belarus
24. Analysis of costs and results in environmental activities
25. Methods of substantiation of the choice of environmental and resource-saving technologies
26. Efficiency of the use of natural resources: environmental intensity, resource yield
27. Determination of anthropogenic load on the ecological situation of cities
28. Environmental principles and economic methods of creating "clean production"
29. Environmental management systems in the enterprise
30. Environmental management systems at transport enterprises
31. Environmental management systems in rail transport
32. Environmental management systems in road transport
33. The impact of water transport on the environment. Ecological problems of water transport.
34. The impact of pipeline transport on the environment. Ecological problems of pipeline transport

35. Environmental management systems in air transport (why not all aircraft are allowed at foreign airports)
36. Resource-saving technologies, their significance and problems of development and implementation in our country and abroad
37. Disposal and recycling of consumer waste in the Republic of Belarus and abroad
38. Problems of garbage cans and parking lots in cities of the Republic of Belarus and abroad.
39. Problems of landfills for the export of industrial and household garbage (landfills) in the Republic of Belarus and in the world
40. Problems of abandoned animals in the cities of the Republic of Belarus and abroad
41. Property rights and nature: interconnections and contradictions
42. Types of economic mechanisms for environmental management
43. Types and consequences of environmental crises. Criteria and ways out of environmental crises
44. Positive international experience in solving environmental problems.
45. International organizations in the field of environmental protection. International treaties and conventions.
46. Nature conservation financing in the Republic of Belarus and abroad
47. Development of environmental insurance in the Republic of Belarus
48. International Environmental Management Standards
49. Environmental audit in the Republic of Belarus and abroad
50. New directions of activity in environmental entrepreneurship of the Republic of Belarus and the world
51. Environmental payments: nature, types, classification, tariffs, economic calculations
52. Taxation in the environmental sphere: current status and proposals of scientists on its improvement.
53. Environmental leasing: the essence and economic efficiency for all participants in the activity
54. International environmental organizations: the nature, significance, financing of activities, control over the use of funds
55. The system of environmental funds of the world: importance, principles of creation, financing, control over the use of funds
56. Modern international and national (Republic of Belarus) programs in solving environmental problems: the nature, significance, financing, control over the use of funds
57. Territories with a tense environmental situation (a special regime of nature use and economic activity).
58. Social and environmental monitoring as a system.
59. Economic growth and its environmental consequences (reports by scientists of the Club of Rome).
60. Energy is a problem of growth and consumption.
61. Population growth and resource problems

### Questions to the credit

1. Subject, methodology and the cause aims.
2. Peculiar properties nature and society cooperation.
3. Theoretical aspects of the environmental economics.
4. Nature conditions and resources as the factor of economic development.
5. Ecology economic problems the quality assurance of the airspace.
6. Ecological economic aspects of the water resources use and protection.
7. Ecological economic problems of land usage.
8. Usage and protection problems of forests and other biological resources.
9. Rational environmental usage and subsoil resources' protection.
10. Environmental control: essence, methods, functions.
11. The prediction and planning system of environmental activities and nature resources rational usage
12. Law regulation of the environmental and nature usage activity.
13. Bases of norms and standardization in the sphere of environment protection.
14. Observation, accounting and monitoring in the environmental protection sphere.
15. Economic nature resources values.
16. Methods of nature resources value.
17. Economic values of the harm after the anthropogenic environmental influence .
18. Nature protection costs and their economic justification.
19. Economic stimulating of rational environment usage and nature protection activity.
20. Financing of nature protection events.
21. Forming of the market institutions of ecological economic control.
22. Global ecological problems of humankind.
23. Regional ecological problems and ways of their solutions.
24. Problems of environment protection and efficient nature resources in the republic of Belarus.
25. International cooperation in the sphere of nature protection.

**5. PROTOCOL FOR THE COORDINATION OF THE CURRICULUM OF THE UVO**

Training Name disciplines with which approval required	Title departments	Suggestions about changes in the curriculum content institutions of higher discipline education	The decision made by the department that developed the curriculum (indicating the date and protocol numbers)
Resource Saving Economics and Resource Efficiency Assessment in AIC	Department of Economics of AIC	no	

РЕЦЕПТОРІЙ ПЛАН

ADDITIONS AND CHANGES TO THE EDUCATIONAL PROGRAM  
ON STUDIED EDUCATIONAL DISCIPLINE  
for \_\_\_\_ / \_\_\_\_ academic year

№	ADDITIONS AND CHANGES	The base

The curriculum is reviewed and approved at a meeting of the department  
\_\_\_\_\_ (protocol No. \_\_\_\_ from \_\_\_\_\_ 20\_ .)

Head of Department

A.A.Kazlou

APPROVED BY

Dean of the faculty

A.V. Gribov

РЕПОЗИТОРІЙ ГТАУ

РЕПОЗИТОРІЙ ГТАУ