MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

Syllabus
of the academic discipline
"ECOLOGY"

for full-time students
of training direction
6.140103 "Tourism"

Харків. Вид. ХНЕУ ім. С. Кузнеця, 2014

Затверджено на засіданні кафедри управління персоналом та економіки праці.

Протокол № 10 від 28.02.2014 р.

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S98 Syllabus of the academic discipline "Ecology" for full-time students of training direction 6.140103 "Tourism" / compiled by O. Slavgorodska. – Kh. : Publishing House of S. Kuznets KhNUE, 2014. – 52 p. (English)

The structure of the academic discipline and its content according to its modules and themes are given. Plans of lectures and seminars are contained, materials for consolidation of knowledge (independent work, test questions), methodical guidelines for the evaluation of students' knowledge, professional competences which a student must have after mastering the discipline are placed.

Recommended for students of training direction 6.140103 "Tourism".

Подано тематичний план навчальної дисципліни та її зміст за модулями й темами. Вміщено плани лекцій та семінарських занять, матеріали для закріплення знань (самостійну роботу, контрольні запитання), методичні рекомендації щодо оцінювання знань студентів, професійні компетентності, якими повинен володіти студент після вивчення дисципліни.

Рекомендовано для студентів напряму підготовки 6.140103 "Туризм".

Introduction

The term "Ecology" and its derivatives are widely and actively used nowadays. For the whole humanity ecology has become not only a science but also a means of thought, behavior, reality of actions, to some degree even a world view. Without exaggeration, it is possible to say that ecology has become one of the aspects of humanism, combining spirituality, understanding the unity of man with nature, high culture, intellect.

According to the classification accepted now any change in the environment is included into the jurisdiction of ecology. Reasons for such changes can be both natural processes and anthropogenic influence. Ecology, constantly extending the number of the examined environment factors, studies their influence on individuals, populations, associations and man. From here direct connection of ecology with economic and recreational activities of man, with organization and realization of rest and tourist activity flows out.

For taking the most effective decisions it is necessary to know and understand the structure of the Earth and the biosphere, mechanisms of co-operation in the system "the society – the environment – the technological sphere", to know about legal and recreational constituents of ecological problems.

The academic discipline "Ecology" is a normative academic discipline and it is studied according to the curriculum of training specialists of academic degree "Bachelor" of training direction 6.140103 "Tourism" of the day form of study.

1. Description of the Academic Discipline

<table>
<tr><td rowspan="2">Name of indexes</td><td rowspan="2">Subject area,
training direction,
academic degree</td><td>Description
of the academic discipline</td></tr>
<tr><td>Day form of study</td></tr>
<tr><td>Number of credits
according to ECTS: 3</td><td>Subject area :1401
"Service Sector"</td><td>Normative</td></tr>
<tr><td>Modules: 2</td><td rowspan="5">Training direction:
6.140103 "Tourism"</td><td>Academic year</td></tr>
<tr><td rowspan="2">Thematic modules: 2</td><td>1st</td></tr>
<tr><td>Term</td></tr>
<tr><td rowspan="2">Total number of hours: 108</td><td>1st</td></tr>
<tr><td>Lectures</td></tr>
<tr><td rowspan="7">Hours for the day form
of study per week:
class hours: 3;
independent work
of a student : 3.75</td><td rowspan="7">Academic degree:
bachelor of tourism</td><td>32 hours</td></tr>
<tr><td>Seminars</td></tr>
<tr><td>16 hours</td></tr>
<tr><td>Independent work</td></tr>
<tr><td>60 hours</td></tr>
<tr><td>Type of control</td></tr>
<tr><td>Final assessment test</td></tr>
</table>

Note. The correlation of the number of hours for class work to independent work makes 80 %.

2. The Purpose and Tasks of the Academic Discipline

The purpose of teaching this academic discipline is forming by the students the necessary base of knowledge in theoretical and practical issues of modern ecology, the consideration of basic sources of operating the

environment, the formulation of top priority requirements for the preservation of the environment, forming knowledge and skills in taking and impementing scientifically grounded decisions in relation to ecological problems, cultivating the bases of ecological culture.

For achieving this purpose, the following basic ***tasks*** are set:

to understand conformities to the law of development of ecological systems and features of the co-operation of factors and components of the environment of their functioning;

to learn to explain ecological laws in the context of their types which form systems, principles, spheres of action and connections with other socio-economic and natural laws, practice of nature management;

to determine the motive dominants of ecological transformations in the profile of the integration degree of ecology types and the evolutional advancement of humanity;

to master the conceptual and terminological apparatus and definitions which are used in the integrated analysis of ecological processes and phenomena;

to find out the contradictions of the process of the ecologization of public recreation and to determine the potential for their solving under conditions of the development of the scientific and technical progress and globalization;

to form ecological consciousness and professional competency taking into account the requirements of ecological safety of vital functions and determinant principles of the strategy of steady development.

"Ecology" is an academic discipline, which studies the tools of research of the aggregate or structure of connections between organisms and the environment of their existence.

The object of the academic discipline is made up by the relationships of living organisms or groups of organisms with the environment, the mutual relations between different living organisms, in the broad understanding – ecological systems.

The subject of study of the academic discipline is the integrated system of conformities to the law of the interaction of living organisms and the natural environment.

A student begins studying this academic discipline at the beginning of studies in the higher educational establishment. The theoretical and methodological basis of studying this discipline is the theoretical knowledge of

general subjects of biology, geography, physics, chemistry, natural science and other natural disciplines, which are studied at comprehensive secondary school. According to the structural and logical layout, the academic discipline "Ecology" is studied collaterally with the following disciplines: "Regional Economics", "Safety of Vital Functions", "Geography of Tourism". For the students of training direction 6.140103 "Tourism" the knowledge in this discipline creates conditions for successful mastering of the following academic disciplines: "Organization of Tourism", "Management", "Law", "Enterprise Economics", "Recreational Sites", "Organization of Hotel Economy", as well as the implementation of trainings, interdisciplinary comprehensive term papers, bachelor's and master's diploma papers.

In the process of study, students get necessary knowledge during lectures and fulfillment of practical tasks. Most stumpers are taken away for the consideration and discussion during seminars. The independent work of students has a great value in the process of study and consolidation of knowledge. All the types of study are developed in accordance with the credit and module system of the organization of the educational process.

As a result of study of the academic discipline a student must:

know: the basic paradigms of the science "Ecology"; the theoretical and practical principles of ecology as a science; the content, priority purposes and tasks, structure, scientific principles, methods of ecology as a science; the legislative base and normative legal requirements concerning ecological problems; the object, subject and methods of modern ecology; the basic terms, concepts and theoretical positions of modern ecology; general conformities to the law of development and interaction of the system "man – society – biota – environment"; the ecosystem level of the matter organization; the general properties of the biosphere; the global ecological problems; the basic forms and features of the anthropogenic influence on the natural environment; natural scientific and economic bases of the rational nature management; the economic principles of the protection of the environment from the contamination; basic normative documents and laws of Ukraine in the sphere of the protection of the natural environment and the rational nature management; basic methods of the environment quality management and rational nature management; basic methods of ecological management and ecological marketing; basic concepts and principles of ecological safety; basic principles of international cooperation in the sphere of ecology;

be able: to apply fundamental ecological knowledge for the estimation of ecological and economic state of a settlement, city, region, country; to use effectively ecological reference books, legislative and normative documents about the environment protection; to formulate practical suggestions for improving the state of the natural environment and the rationalization of nature management; to determine optimum ways of the environment quality management; to analyze the observance of norms of using resources; to estimate the efficiency of an enterprise activity in the sphere of the environment protection and rational nature management; to apply the modern methods for solving of ecological and economic problems and rational nature management; to plan and develop economically grounded measures for the environment protection and rational use of natural resources; to estimate the level of the ecological safety of a city, region, country; In the process of teaching of the academic discipline, the basic attention is given to students' mastering professional competencies, which are shown in Table 2.1.

Table 2.1

Professional competences, which students obtain after learning the academic discipline

Code of competence	Name of competence	Constituents of competence
1	2	3
E* 1	To distinguish, understand and determine basic concepts, conformities to the law, systems and features of ecology as a science, its theoretical principles	To distinguish and characterize the basic paradigms of the science "Ecology" for the application in the professional activity
		To distinguish and characterize general conformities to the law of the development and interaction of the system "man – society – biota – environment"
		To distinguish and characterize the basic concepts of the doctrine about the biosphere and noosphere, of the biosphere structure, global problems of the biosphere
		To determine basic forms and peculiarities of the anthropogenic influence on the environment

Table 2.1 (continued)

1	2	3
E* 2	To develop effective decisions in the rational nature management and the environment protection	To identify natural scientific and economic bases of the rational nature management, its operating economic mechanism
		To understand and effectively use basic normative documents and laws of Ukraine in the sphere of the protection of the natural environment and nature management
		To determine optimum ways of the environment quality management
E* 3	To substantiate taking decisions concerning ecological safety under principles of international cooperation in to the sphere of ecology and their implementation	To distinguish and characterize basic concepts and principles of ecological safety
		To determine basic principles of world ecological policy and international cooperation in the sphere of ecology, principles of international ecological law

Note. *Ecology

The structure of constituents of professional competences and their formation according to the National frame of qualifications of Ukraine is given in Supplement A.

3. Thematic Plan of the Academic Discipline

Thematic module 1.

Ecosystem level of matter organization and anthropogenic influence on the environment

Theme 1. Object, method, essence and tasks of ecology

1.1. History of development of ecology

Ecology as a science, its role in modern society. Sources of ecology origin. Historical development of mutual relations of people with the nature. Basic stages of the development of ecology as a science.

1.2. Concept of ecology, its subbject and object

The concept of ecology, its subbject and object. The structure of ecology as a science.

1.3. Tasks of ecology

Fields of ecology and their tasks.

Theme 2. Ecosystem level of matter organization

2.1. Natural environment and ecological factors

Concept of natural environment. Definition of natural environment, contamination of natural environment. Types of natural environment.

Ecological factors of environment: concept and classification. General conformities to the law and influence on living organisms. Limiting factors.

2.2. Populations

Concept of population. Static and dynamic indexes of populations. Dynamics of populations quantity. Regulation of populations density.

2.3. Ecosystems

Concept of ecosystems, classification of ecosystems. Energy and principles of ecosystems functioning. Acceptable influence and firmness of ecosystems. Ecosystems development: succesion.

Concept of ecological components. Basic ecological components of ecosystems: energy, atmosphere, water, soil, information, biota. Description of each of these ecological components. Ecological pyramid.

Homoeostasis. Homoeostasis as a balanced state of the natural systems. Trophic chain and its varieties. Trophic systems.

2.4. Laws of ecology

Basic ecological laws. The value of laws by B. Commoner and D. Chiras for the rational nature management.

Theme 3. Biosphere as the global ecosystem of the Earth. Global ecological problems

3.1. Biosphere

Terms "biosphere" and "living matter". The doctrine by V. I. Vernadsky about biosphere and noosphere. The biosphere limits. The biosphere as one of the shells of the Earth. Atmosphere, sial, hydrosphere in the biosphere composition.

3.2. General properties of biosphere

The circulation of matter and energy in the biosphere. Ecosystems place in the biosphere organization. Biogenic chemical elements. Biogeochemical cycles.

The dynamics and evolution of the biosphere.

3.3. Global ecological problems

Global ecological problems. Demographic problem. Contamination of the natural environment. Climate warming. The UNO frame convention about climate changes. Ozone layer exhaustion in the stratosphere. Troposphere ozone. Acidulation of the natural environment. Acid rains. Problem of treatment of and dealing with the waste products. Nuclear night and nuclear winter.

Theme 4. Anthropogenic influence on the environment

4.1. The environment contamination

Sources, kinds and scale of the environment contamination. Conduct of contaminants in the environment. The most widespread contaminants. Synergism phenomenon. Global character of the influence of the anthropogenic contamination on the biosphere and separate ecosystems.

Types of the environment contamination: chemical, physical, biological, mechanical, radiation, electromagnetic ones, action of noise, vibrations, etc.

4.2. Influence of different industries on the environment state

Mining industry. Chemical, petrochemical and petroleum refining industries. Black and coloured metallurgy. fuel-energy complex. Agriculture. housing and communal services. Transport complex.

Contamination of atmosphere, hydrosphere and soil.

Thematic module 2.
Environment protection and rational nature management

Theme 5. Economic mechanisms of the environment protection and nature management

5.1. Natural resources

Classification of natural resources. International natural resources. Resource cycle as the anthropogenic circulation of matters. Principles of the rational nature management. Modern ecological requirements to the activity of the man.

5.2. Rational nature management

Concept of low-waste processes and zero-emission (waste-free) technologies. Classification of waste products. Problems of waste products utilization in different spheres of the activity of the man.

Basic principles of creating zero-emission technologies. Zero-emission consumption.

5.3. Methods of nature protection activity management

Economic mechanism of the environment protection. Ecological and economic indeces of production processes estimation. Efficiency of measures for the environment protection. The methodical approaches to the determination of economic and social losses from the environment contamination. Economic stimulation of nature protection activity of subjects of entrepreneurship.

Endorsement and issuing licenses for the right for nature management. Ecology funds. Ecological insurance.

Theme 6. Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine

6.1. Control and quality management of the environment

The concept of the summation effect. The environment quality estimation criteria. The environment quality standards.

6.2. Ecological monitoring

Concept of the ecological monitoring and its tasks. Classification of monitoring. Forming database for the ecological monitoring. Composite monitoring of the biosphere. The provision of monitoring.

The estimation of the influence of an industrial or tourist object on the environment. Ecological appraisal of objects. Control of waste products of industrial enterprises and other economic organizations.

6.3. Legislation in the sphere of the environment protection

Legal bases of the protection of atmospheric air, water objects, bowels of the earth. Legislation in the sphere of the reserve activity.

Ecological legislation. Concept, subject and sources of ecological legislation. Ecological offences. Legal mode of nature management and the environment protection. Types of responsibility for ecological offences.

Theme 7. Ecological management and marketing

7.1. Ecological management

Concept, subject and functions of ecological management. Forming mechanisms of nature management in market economy. The cost estimation of the biota ecosystem components.

Ecological management at different kinds of enterprises.

7.2. Ecological marketing

Ecological marketing: essence, aims, methods and objects.

7.3. Ecological audit

Ecological audit: tasks, procedures, effectiveness.

Theme 8. Ecological safety and ecological risks

8.1. Ecological safety

Basic concepts of ecological safety. Constituents of ecological safety. Kinds, sources and consequences of ecological danger. Ecological crises, ecological situations. Anthropogenic factors of the origin of negative ecological situations. Extraordinary ecological situations. Regulation of ecological situations.

8.2. Ecological risk

Concept of ecological risk. Danger and safety. "Acceptable" risk. Estimation and principles of risk management.

Theme 9. World ecological policy. International integration in the field of ecology

9.1. International integration in the field of ecology

International cooperation in the field of ecology. "Program of actions" of the UNO conference on the environment and development in Rio-de-Janeiro in 1992 Kioto protocol on diminishing hotbed gases emission. Stockholm convention on the organic contaminating substances. Vienna convention on the ozone layer protection and Montreal protocol on reducing the emission of ozonedecomposing substances.

9.2. International ecological law

4. Structure of the Academic Discipline

From the very beginning of learning the academic discipline every student must become acquainted both with the syllabus of the academic discipline and forms of tuition organization and with the structure, contents and volume of each of its educational modules, and also with all the types of control and the methods of the evaluation of the formed professional competences.

Learning the academic discipline is carried out by the student by way of the successive and thorough working at the educational modules. An educational module is a separate, relatively independent unit of the academic discipline, which logically unites several educational elements of the discipline

according to their contents and interconnections. The thematic plan of the academic discipline consists of two thematic modules (Table 4.1).

Table 4.1

Structure of the test credit of the academic discipline

Names of the thematic modules and themes	Total	Lectures	Seminars	Independent work: Preparation for classes
Thematic module 1. Ecosystem level of matter organization and anthropogenic influence on the environment				
Theme 1. Object, method, essence and tasks of ecology	13	4	2	7
Theme 2. Ecosystem level of matter organization	13.5	4	2	7.5
Theme 3. Biosphere as the global ecosystem of the Earth. Global ecological problems	13.5	4	2	7.5
Theme 4. Anthropogenic influence on the environment	13.5	4	2	7.5
Total according to Thematic module 1	53.5	16	8	29.5
Thematic module 2. Environment protection and rational nature management				
Theme 5. Economic mechanisms of the environment protection and nature management	13.5	4	2	7.5
Theme 6. Ecological monitoring of the environment. The legal regulation of ecological ecofriendly relations in Ukraine	13.5	4	2	7.5
Theme 7. Ecological management and marketing	13	4	2	7
Theme 8. Ecological safety and ecological risks	6	2	–	4
Theme 9. World ecological policy. International integration is in the field of ecology	8.5	2	2	4.5
Total according to Thematic module 1	**54.5**	**16**	**8**	**30.5**
All the hours according to the module	***108***	***32***	***16***	***60***

5. Themes and Plans of Seminars

A seminar is a form of classes, at which the teacher organizes a discussion of preliminary fixed themes, for which students prepare theses of a report.

At each seminar the teacher evaluates reports and presentations prepared by students on outlined problems (Table 5.1), their speeches, activity in discussions, ability to formulate and defend their position, etc.

Final total marks for every seminar are put in the corresponding register. Marks, which a student gets for a separate seminar, are taken into account in the process of the accumulation of the final mark in this academic discipline.

Table 5.1

Plans of seminars

Theme	Program questions	Number of hours	Literature
1	2	3	4
Thematic module 1. Ecosystem level of matter organization and anthropogenic influence on the environment			
Theme 1. Object, method, essence and tasks of ecology	1. Basic stages of ecology development 2. Subject and object of ecology. 3. Basic tasks of ecology	2	Main: [1 – 6]. Additional: [7– 14, 16 – 22; 24 – 27]
Theme 2. Ecosystem level of matter organization	1. Ecological factors. 2. Concept of population, static and dynamic population indices. 3. Demographic problem in Ukraine. 4. Life-span and factors which stipulate it. 5. Concept of ecosystem and its components 6. Basic ecosystems of the planet (biomes). 7. Succesion and homoeostasis 8. Trophic chains and systems. 9. Pyramids of mass and energy. 10. Practical value of ecology laws	2	Main: [1 – 5]. Additional: [7 – 9; 12; 13; 19; 22 – 27]
Theme 3. *The biosphere as the global ecosystem of the Earth*	1. The doctrine by V. I. Vernadsky about biosphere and noosphere. 2. The structure of the biosphere. 3. The circulation of basic chemical elements and substances in the biosphere		Main: [1 – 4]. Additional: [7 – 9; 12; 13; 19; 22 – 27]

Table 5.1 (continued)

1	2	3	4
Global ecological problems	4. Global ecological problems and possibilities of solving them at present. 5. Differences of small and large circulation of chemical elements and substances	2	
Theme 4. Anthropogenic influence on the environment	1. Types of the environment contamination. 2. The influence of contaminating factors on the man, environment and objects of economic activity. 3. Ecological state of air, surface and underground waters, soil. 4. Radioactive contammination of the environment objects. 5. The influence of the electromagnetic contamination upon the man and the environment. 6. The global warming of the climate. Kioto protocol. 7. The destruction of the Earth ozone layer. 8. The exhaustion of natural resources	2	Main: [1 – 4]. Additional: [8; 9; 12; 13; 19; 21 – 28]
Thematic module 2. Environment protection and rational nature management			
Theme 5. Economic mechanisms of the environment protection and nature management	1. Natural resources and natural conditions. 2. Resource cycle. 3. Situation with natural resources in Ukraine. 4. Principles of rational nature management 5. Basic principles of creating zero-emission (waste-free) technologies. 6. Methods of nature protection activity management. 7. Essence of economic mechanisms of the environment protection. 8.Types of payment in Ukraine for the environment contamination. 9.Economic stimulation of nature protection activity	2	Main: [1 – 4]. Additional: [7; 9; 11 – 13; 16; 17; 19; 22 – 27]
Theme 6. Ecological monitoring	1. The concept of the environment quality: the essence, parameters, actuality	2	Main: [1 – 3; 5]

Table 5.1 (the end)

1	2	3	4
of the environment. The legal regulation of ecological relations in Ukraine	2. Fixing rates of the environment quality. 3. The essence of the concept of the environment monitoring, its aims and tasks. 4. Types of the environment monitoring 5. The state system of monitoring the environment level in Ukraine. 6. The legislation in the shpere of fixing rates of the environment quality: the concept of standards, types of standards. 7.The control of the environment quality: functions, methods, the organization of the environment quality control at the local, regional, state level		Additional: [7 – 9; 13 – 17; 21; 22; 25]
Theme 7. Ecological management and marketing	1. Ecological management, its subject and object. 2. Principles and elements of the system of ecological management. 3. The international experience in the sphere of ecological menagement. 4. International standards in the system of ecological management 5. Ecological management at different kinds of enterprises. 6. Ecological marketing. 7.Ecological audit. 8. Ecological insurance	2	Main: [1; 4 – 6]. Additional: [7; 13; 14; 20; 22; 26]
Theme *9*. World ecological policy. International integration in the sphere of ecology	1. The strategy of stable development. 2. Criteria and principles of steady development. 3. International ecological organizations and principles of international cooperation in the sphere of ecology 4. Basic directions and forms of the international cooperation in the sphere of ecology. 5. The participation of Ukraine in international ecological cooperation	2	Main: [1 – 5]. Additional: [14; 15; 21; 23]
Total number of hours		**16**	

6. Independent Work

The independent work of students (IWS) is a form of the educational process organization, according to which the planned tasks are executed by a student independently under the methodical guidance of the teacher.

The purpose of IWS is mastering in full the syllabus of the academic discipline and forming general and professional competencies, which play a substantial role in becoming a future specialist of higher level of qualification.

The educational time, given for the independent work of students of the day form of study, is determined by the curriculum and makes 55.6 % (60 hours) of the general volume of the educational time for the study of the academic discipline (108 hours). During the independent work a student must grow into an active participant in the educational process, learn to consciously master theoretical and practical knowledge, freely orientate himself/herself in the informative space, carry one's own responsibility for the quality of one's own professional preparation. IWS includes: working at the lecture material; working at and studying recommended literature, basic terms and concepts according to the themes of the academic discipline; preparing for seminars; preparing for making speeches at seminars; deepened working at separate lecture themes or questions; writing reports according to the given problems; searching (selecting) and reviewing literature sources according to the given problems of the discipline; analytical consideration of a scientific publication; control verification by the students of their personal knowledge according to the questions for self-diagnostics; preparing for tests and other forms of current control; preparing for the module control; systematizing the material studied with the purpose of preparing for the term test.

The necessary element of successful mastering the material of the academic discipline is the independent work of students with the domestic and oversea special literature in ecology, normative acts on issues of the government control of ecological problems, statistical materials.

The basic types of the independent work, which are offered to the students for mastering theoretical knowledge in the academic discipline, are given in Table 6.1.

Table 6.1

Tasks for independent work of students and forms of its control

Name of theme	Contents of the independent work of students	Number of hours	Forms of IWS control	Bibliography
1	2	3	4	5
Thematic module 1. Ecosystem level of matter organization and anthropogenic influence on the environment				
Theme 1. Object, method, essence and tasks of ecology	Study of the lecture material, preparation for the seminar. Preparation of reports and information on the theme; review of the theoretical material of the theme "Object, method, essence and tasks of ecology"	7	Presentation of results	Main: [1 – 5] Additional: [6 – 13; 15 – 27; 30]
Theme 2. Ecosystem level of matter organization	Study of the lecture material, preparation for the seminar. Preparation for the test on themes 1, 2. Review of the theoretical material of the theme "Ecosystem level of matter organization"	7.5	Written test on themes 1, 2. Presentation of results	Main: [1 – 4]. Additional: [6 – 8; 11; 12; 18; 22 – 27; 30; 32]
Theme 3. The biosphere as the global ecosystem of the Earth. Global ecological problems	Study of the lecture material, preparation for the seminar. Review of the theoretical material of the theme "The biosphere as the global ecosystem of the Earth. Global ecological problems"	7.5	Presentation of results. Express questioning	Main: [1 – 4]. Additional: [6 – 13; 15 – 27; 30; 32]
Theme 4. Anthropogenic influence on the environment	Search, selection and review of literature sources on the given subject; study of the lecture material, preparation for the seminar. preparation for the test on themes 3, 4	7.5	Written test on themes 3, 4. Presentation of results	Main: [1 – 4]. Additional: [7; 8; 11; 12; 18; 20; 22 – 27; 30; 32]
Total according to thematic module 1		**37**		

Table 6.1 (the end)

1	2	3	4	5
Thematic module 2. Environment protection and rational nature management				
Theme 5. Economic mechanisms of the environment protection and nature management	Study of the lecture material, preparation for the seminar. Search, selection and review of literature sources on the given subject. Preparation of reports and information on the theme, presentations on the material studied	7.5	Presentations In Power Point on the material studied	Main: [1 – 5], Additional; [6; 8; 10 – 12; 15; 16; 18; 22 – 27; 30]
Theme 6. Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine	Search, selection and review of literature sources on the given subject. Study of the lecture material, preparation for the seminar. preparation for the test on themes 5, 6	7.5	Written test on themes 5, 6. Presentation of results	Main: [1; 2; 3; 5]. Additional: [6 – 8; 12 – 16; 20; 22; 24]
Theme 7. Ecological management and marketing	Study of the lecture material, preparation for the seminar. Search, selection and review of literature sources on the given subject	7	Presentation of results. Express questioning	Main: [1; 3 – 5]. Additional: [6; 12; 13; 19; 22; 25; 30; 32]
Theme 8. Ecological safety and ecological risks	Search, selection and review of literature sources on the given subject. Study of the lecture material, preparation for the seminar. Preparation for the test on themes 7, 8	4	Written test on themes 7, 8. Presentation of results	Main: [1 – 5]. Additional: [6; 12; 13; 20; 25]
Theme 9. World ecological policy. International integration in the sphere of ecology	Search, selection and review of literature sources on the given subject. Study of the lecture material, preparation for the seminar. Preparation for the test	4.5	Written test	Main: [1 – 3; 5]. Additional: [13; 14; 20; 23; 30; 32]
Total according to thematic module 2		**23**		
Total according to the module		**60**		

6.1. Questions for Self-Diagnostics

Theme 1. Object, method, essence and tasks of ecology

1. On the junction of what sciences did ecology appear?
2. What basic stages can be singled out in the history of ecology development?
3. Describe the first stage of the development of ecology as a science, name scientists who made a considerable contribution into its development at this stage.
4. Describe the second stage of the development of ecology as a science, name scientists who made a considerable contribution into its development at this stage.
5. Define and describe the main signs of the modern stage of the development of ecology as a science. Name the names of modern prominent researchers in the sphere of ecology and describe their ideas.
6. What definitions of ecology as a science do you know?
7. What do the object and subject of ecology research consist in?
8. What branches of ecology are there?
9. What do the basic tasks of ecology consist in as regards the general theoretic plan?
10. What are the basic applied tasks of ecology?
11. Describe the basic sections of ecology as an academic discipline.
12. What basic directions of ecological research do you know?

Theme 2. Ecosystem level of matter organization

1. Define the concept "environment" and its types.
2. Describe the term "ecological factors".
3. Classify ecological factors.
4. Describe the concepts of the area of factor optimum and the area of factor pessimum, ecological valency, limiting factors.
5. Name basic descriptions and indexes of populations.
6. What is the essence of the concept of ecosystem?
7. Describe components and basic properties of ecosystems.
8. What is succesion?
9. What are the principles and energy of functioning of ecosystems?
10. Describe the concepts "food chains" and "food networks".
11. Name the basic ecological laws.

12. The law of minimum (by Liebig) and law of limiting factors (by Blekhman).

13. The law of tolerance by Shelford.

14. Laws by Commoner.

15. Biogeochemical principles by Vernadsky – Bauer.

Theme 3. The biosphere as the global ecosystem of the Earth. Global ecological problems

1. Describe the concepts "biosphere" and "living matter".

2. What is the essence of the doctrine of V. I. Vernadsky about the biosphere and noosphere?

3. The atmosphere, sial, hydrosphere in the composition of the biosphere. Sizes and parameters of the biosphere.

4. Describe the circulation of substances and energy in the biosphere.

5. The dynamics and evolution of the biosphere.

6. Give the general description of global ecological problems.

7. Disclose the essence of the demographic problem.

8. Define the essence of the problem of the contamination of the natural environment.

9. Explain the essence of the problem of the climate temperature rise. The frame UNO convention about the changes of climate.

10. Describe the essence of the problem of ozone layer exhaustion in the stratosphere. The troposphere ozone.

11. Describe the essence of the problem of the environment oxidization. Acid rains.

12. The problem of handling the production waste.

13. The nuclear night and nuclear winter.

Theme 4. Anthropogenic influence on the environment

1. Name the basic sources of the anthropogenic contamination of the natural environment.

2. In what way does the human activity impact the natural environment?

3. What types of the contamination of the natural environment are singled out?

4. What is the quantitative description of the contaminating substance?

5. Enumerate the indexes of the maximum possible concentration level of the contaminating substance.

6. Describe the influence of some industries and national economy on the natural environment.

7. Name and describe the basic sources of the atmosphere contamination.

8. Name and describe the basic sources of the hydrosphere contamination.

9. Name and describe the basic sources of soils contamination.

Theme 5. Economic mechanisms of the environment protection and nature management

1. What spheres of the negative influence of the human activity on the natural environment do you know?

2. Describe the concepts "natural terms", "nature management", "rational nature management".

3. What do functions and methods of management in the sphere of protection of the natural environment consist in?

5. Explain the content of the concept "natural resources".

6. Give the natural (genetic) classification of natural resources.

7. Give the ecological classification of natural resources.

8. Give the economic classification of natural resources.

9. Give the market classification of natural resources.

10. What does the essence of nature management principles consist in (the ecological requirements to the human activity, the observance of which would reduce to a minimum its harmful consequences)?

11. Explain the content of the concepts "low-waste technology" and "zero-emission technology"?

12. Define the concept "waste products" and give the classification of waste products.

13. Define the concept "damage" and give the classification of damage types.

14. According to what formulas is the estimation of damage from the atmosphere contamination calculated?

15. What positive measures of economic stimulation and methods of negative motivation specific for nature management do you know?

Theme 6. Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine

1. Define the concept "monitoring" and give a classification of its kinds.

2. Define the primary objective and structure of the ecological monitoring of environment.

3. Explain the essence of the concept "control of quality of the natural environment quality control", give a classification of the environment quality standards.

4. Describe the State system of the monitoring of the natural environment in Ukraine and its structure.

5. What are the basic principles and tasks of the State system of the monitoring of the natural environment in Ukraine?

6. According to what methods is the estimation of the influence of the industrial object on the natural environment carried out?

7. What is the purpose of carrying out EISE (the estimation of the influence on the surrounding environment) and the consideration of what issues are included in the EISE procedure?

8. What is the essence and tasks of the ecological examination?

9. Define the basic principles of the nature protection service organization at an enterprise of the tourist sphere.

10. What laws of Ukraine in the sphere of the environment protection and rational nature management regulate ecological relations in the country?

Theme 7. Ecological management and marketing

1. Describe the concept, object and functions of ecological management.

2. How are the nature management mechanisms formed in the market economy?

3. What technologies of ecological management are used at enterprises of different industries?

4. What technologies is ecological management carried out with at the enterprises of tourist sphere?

5. What international standards exist in the system of ecological management?

6. What examples of the international experience in the sphere of ecological management do you know?

7. Explain the essence, aims, methods and objects of ecological marketing.

8. What methods are used when estimating the value of biota components of ecosystems?

9. What do tasks and procedures of ecological audit consist in?

Theme 8. Ecological safety and ecological risks

1. Explain the content of the concept "ecological safety".

2. Describe the constituents of ecological safety.

3. What kinds, sources and consequences of ecological danger are there?

4. What natural factors of the origin of ecological crises and unfavorable ecological situations do you know?

5. What are the anthropogenic factors of the origin of ecological crises and unfavorable ecological situations?

6. What methods of adjusting are used for unfavorable ecological situations?

7. What types of losses from ecological catastrophes, extraordinary ecological situations can there be? What methods of their estimation do you know?

8. What approaches to the risk interpretation do you know?

9. Explain the content of risk as of an economic category.

10. Explain the essence of the concepts "ecological risk", "safety and danger".

11. What does the content of the concept "acceptable risk" consist in?

12. What do risk management principles and of risk estimation methods consist in?

Theme 9. World ecological policy. International integration in the sphere of ecology

1. What principles is the international cooperation in the sphere of ecology based on?

2. What forms of collaboration in the sphere of ecology exist between countries?

3. Classify objects of the protection of the natural environment.

4. Enumerate agreements concerning the solution and settlement of global ecological problems.

5. What is the content of "Program of actions" of the UNO conference for the environment and development in Rio de Janeiro in 1992?

6 Explain the content of the provisions of the Kioto protocol for diminishing hotbed gases emission.

7. Explain the content of the Stockholm convention about the organic contaminating substances.

8. What do the basic provisions of the Vienna convention on the ozone layer protection and the Montreal protocol on reducing the emission of ozone decomposing substances consist in?

9. What international conventions and agreements ratified by Ukraine do you know?

10. What do the principles of the international ecological law consist in?

7. Individual Consultative Work

The individual consultative work is carried out according to the schedule of the individual consultative work in the form of individual classes, consultations, the check and defence of tasks, which are meant for the current control, etc.

The forms of the organization of the individual consultative work are as follows:

а) for mastering the theoretical material:

consultations: individual ones (question-answer), group ones (considering typical examples-situations);

б) for the general evaluation of mastering the program material:

individual defence of tasks performed.

8. Methods of Enhancement of Studies

In the process of teaching the academic discipline “Ecology” the following active and interactive educational technologies to enhance the educational and cognitive activity of students are applied: problem lectures, mini-lectures, work in small groups, seminars-discussions, brainstorming, case-method, presentations, business and role games; computer simulations, Delphi method, scenarios method, banks of visual support, etc. (Tables 8.1 and 8.2).

Table 8.1

Distribution of forms and methods of enchancement of the process of studies according to the themes of the academic discipline

Theme	Practical application of educational technologies
1	2
Theme 1. Object, method, essence and tasks of ecology	Lecture of problem character on the issue "Is ecology a science or world view?", work in small groups, presentation of results, banks of visual support
Theme 2. Ecosystem level of matter organization	Mini-lecture on the issue "Biological variety as a condition of stability of any ecosystem", work in small groups, presentation of results, banks of visual support

Table 8.1 (the end)

1	2
Theme 3. The biosphere as the global ecosystem of the Earth. Global ecological problems	Lecture of problem character on the issue "Condition of stability and energy in ecosystems and the biosphere", work in small groups, presentation of results, banks of visual support
Theme 4. Anthropogenic influence on the environment	Mini-lecture in the issue "Advantages and disadvantages of the Kioto protocol concerning Ukraine", work in small groups, presentation of results, banks of visual support
Theme 5. Economic mechanisms of the environment protection and nature management	Lecture of problem character on the issue "Economic importance of the environment quality for man", work in small groups, presentation of results, banks of visual support
Theme 6. Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine	Lecture of problem character on the issue "Degree of fulfilmen of ecological laws", presentation of results, banks of visual support
Theme 7. Ecological management and marketing	Mini-lecture on the issue "Is the notion of ecologically clean commodities a reality?", banks of visual support
Theme 8. Ecological safety and ecological risks	Lecture of problem character on the issue "Growth of the role of ecological safety in the life of society", banks of visual support
Theme 9. World ecological policy. International integration in the sphere of ecology	Mini-lecture on the issue "World ecological policy", work in small groups, presentation of results, banks of visual support

The basic differences of active and interactive methods of studies from traditional ones are characterized not only by methods and teaching techniques, but also by high efficiency of the educational process which is shown in the following aspects: high motivation of students; consolidation of the theoretical knowledge in practice; increase of students' consciousness; forming the ability to take independent decisions; forming the capacity for taking team decisions; forming the capacity for social integration; acquiring skills in conflicts resolution; developing the capacity for making compromises.

Lectures of problem character make one of the major elements of problem tuition of students. They foresee, apart from the consideration of the basic lecture material, setting and considering problem issues of discussion character, which are not developed enough in science and are topical for theory

and practice. The lectures of problem character are distinguished by deep argumentation of the material which is taught. They are instrumental in forming independent creative thinking of students, inoculating cognitive skills in students. Students become participants in the scientific search and solution of problem situations.

Mini-lectures foresee the exposition of the educational material during a short interval of time and are characterized by considerable capacity, complicacy of logical constructions, images, proofs and generalizations. They are carried out, as a rule, as a part of a research class. Mini-lectures differ from full time lectures in the considerably less duration. Usually mini-lectures last no more than 10 – 15 minutes and are used to carry new information in brief to all listeners. Mini-lectures are often used as parts of the integral theme, which it is desirable to deliver as a full time lecture not to tire the audience. Then information is given in turn by a few separate segments between which other forms and methods of teaching are used.

Seminars-discussions foresee the exchange of opinions and ideas of participants concerning the theme, they also develop thinking, help to form lideas and convictions, elaborate the ability to formulate views and express them.

Work in small groups enables a teacher to structurize the seminar class according to the form and content, creates possibilities for participation of every student in the work on the theme, provides formion of personality qualities and the experience of social intercourse.

Brainstorming is a method of solving exigent tasks; the essence of this method consists in the following: it is necessary to express as many ideas as possible in a very limited interval of time, to discuss them and carry out their selection.

Presentations are public addresses before the audience, which are used for submitting certain achievements, the results of the group job, the performances report, the implementation of tasks, project papers. Presentations can be both individual ones, for example, the public appearance of one student and team ones, that is, public appearances of two and more students.

The Delphi method is used with the purpose of achieving the consensus in expert estimations and foresees giving the possibility to express their opinions to the group of experts who work individually in different places. When choosing an administrative decision according to this method the academic group is divided, for example, into five small groups. Four groups are working ones, they develop and take an administrative decision, and the fifth

group is the expert one. The analysis and variants of administrative decisions of working groups is making average by this group. The expert group can be divided aaccording to specializations.

A computer simulation (game) is a method of teaching, which is based upon using special computer programs with the help of which the virtual modeling of the business process is possible. Students can change parameters and data, to make decisions and analyze the consequences of these decisions. The purpose of using this method is the development of students' system thinking, their capabilities to planning, forming the abilities to recognize and analyze problems, compare and estimate alternatives, take optimum decisions and operate under conditions of the limited time.

The method of scenarios consists in the development of probable conduct models and the development of the concrete phenomena in prospect.

The banks of visual support are instrumental in the enchancement of the teaching process according to the themes of the academic discipline with the help of visual aids.

Table 8.2

Using methods of enhancement of the process of studies

Theme of the academic discipline	Practical application methods	Methods of enhancement of the process of studies
1	2	3
Theme 1. Object, method, essence and tasks of ecology	*Seminar class*. Theme: "Object, method, essence and tasks of ecology"	Seminars-discussions, presentations, brainstorming
Theme 2. Ecosystem level of matter organization	*Seminar class*. Theme: "Ecosystem level of matter organization"	Seminars-discussions, presentations
Theme 3. The biosphere as the global ecosystem of the Earth. Global ecological problems	*Seminar class*. Theme: "The biosphere as the global ecosystem of the Earth. Global ecological problems"	Work in small groups, brainstorming, Delphi method, method of scenarios

Table 8.2 (the end)

1	2	3
Theme 4. Anthropogenic influence on the environment	*Seminar class*. Theme: "Anthropogenic influence on the environment"	Seminars-discussions, presentations, work in small groups, brainstorming, method of scenarios
Theme 5. Economic mechanisms of the environment protection and nature management	*Seminar class*. Theme: "Economic mechanisms of the environment protection and nature management"	Work is in small groups, brainstorming, Delphi method, method of scenarios, presentations
Theme 6. Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine	*Seminar class*. Theme: "Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine"	Seminars-discussions, presentations, work in small groups, brainstorming, method of scenarios
Theme 7. Ecological management and marketing	*Seminar class*. Theme: "Ecological management and marketing"	Presentations, work in small groups, computer simulation, brainstorming, Delphi method, method of scenarios
Theme 9. World ecological policy. International integration in the sphere of ecology	*Seminar class*. Theme: "World ecological policy. International integration in the sphere of ecology"	Seminars-discussions, presentations, work in small groups, brainstorming method of scenarios

9. Control Methods

The system of the evaluation of formed students' competences (see Table 2.1) takes into account the types of classes, which according to the syllabus of the academic discipline foresee lectures, seminars, and also fulfillment of the independent work. The evaluation of formed students' competences is carried out according to the accumulative 100-grade system. In accordance with the Temporal provision "About the order of the evaluation of

the results of students' studies according to the accumulative grade and rating system" of Simon Kuznets KhNUE, control measures include:

current control which is carried out during the term when carrying out lectures and seminars and assessed by the sum of the accumulated marks (the maximal sum is 100 grades);

module control which is conducted taking into account current control during the corresponding thematic module and is aimed at the integrated evaluation of the results of students' studies after learning the material in the logically completed part of the discipline – a thematic module;

final/semester control which is conducted in the form of a test, in accordance with the schedule of the academic process.

Current control for this academic discipline is conducted in the following forms:

active work during lectures;

active participation in fulfilling tasks at seminars;

active participation in the discussion and presentation of the material during seminars;

verification of presentations in Power Point on the set subject;

carrying out the current testing;

carrying out written tests;

express-questioning.

Final/semester *control* is conducted in the form of a semester test.

The order of carrying out the **current evaluation of students' knowledge.** The evaluation of students' knowledge during seminars and fulfillment of tasks is carried out according to the accumulative 100-grade system after the following criteria:

understanding, the degree of mastering the theory and methodology of problems which are considered;

degree of mastering the actual material of the educational discipline;

acquaintance with the recommended literature, and also with modern literature on the issues which are examined;

ability to combine theory with practice in the process of the implementation of tasks, taken for the consideration in the classroom;

logic, structure, style of the material delivery in written papers and during speeches in classrooms, ability to ground one's position, carry out the information generalization of material and draw conclusions.

The maximal possible mark for the specific task is given under condition of the correspondence of the student's task or his/her verbal answer to all the indicated criteria. The absence of a certain constituent reduces the number of grades. When evaluating tasks, attention is also paid to the quality, independence and timeliness of handing in the tasks fulfilled to the teacher according to the shedule of the educational process. If some of the requirements are not fulfilled, grades will be lowered.

The written test is conducted 5 times per semester and includes tasks of different levels of the complexity in accordance with the themes of a thematic module.

The criteria of the evaluation of the independent students' work outside the lecture room. General criteria according to which the evaluation of the independent students' work outside the lecture room is carried out are as follows: the depth and durability of knowledge, the thinking level, the ability to systematize knowledge in separate themes, the ability to make grounded conclusions, the mastery of the category apparatus, skills and methods of tasks fulfillment, the ability to find the necessary information, carry out its systematization and processing, self-realization during seminars.

The criteria for evaluation of a presentation in Power Point are as follows:

ability to conduct the critical and independent assessment of certain problem issues;

ability to explain alternative views and the availability of one's own point of view, position, on a certain problem question;

application of analytical approaches;

quality and clearness of expressing opinions;

logic, structurization and validity of conclusions concerning a specific problem;

independence in fulfilling the work;

literacy of presenting the material;

use of methods of comparison, generalization of concepts and phenomena;

the work execution.

Written tests include questions on the corresponding themes. The structure of written tests contains tasks of the following types: stereotype, diagnostic, heuristic.

Examples of tasks for written tests

Task 1 (stereotype). Define ecology. Describe the basic tasks of ecology.

Task 2 (stereotype). What component of the biosphere plays a major role in making the Earth climate milder? Prove your opinion.

Task 3 (diagnostic). Describe the ancient views connected with nature and its management. What is their topicality at present?

Task 4 (diagnostic). In what way can ecological laws formulated by B. Commoner be applied for solving modern ecological problems?

Task 5 (heuristic). Define the biosphere. What are the most urgent problems of the modern development of the biosphere? Express your opinion on the optimal ways of their solution.

Task 6 (heuristic). In what way is the negative anthropogenic influence on the environment shown? Suggest scientifically grounded methods of diminishing the environment contamination.

The order of the final control in the academic discipline. The final control of students' knowledge and competences in the academic discipline is conducted on the basis of carrying out the test.

10. Distribution of Grades, which Students Get

The system of evaluating the level of the formed professional students' competencies for the day form of studies is given in Table 10.1.

The distribution of grades within the limits of themes of the thematic modules is given in Table 10.2.

Table 10.2

Distribution of grades according to themes

<table>
<tr><td colspan="9">Current testing and independent work</td><td>Total</td></tr>
<tr><td colspan="4">Thematic module 1</td><td colspan="5">Thematic module 2</td><td rowspan="3">100</td></tr>
<tr><td>T1</td><td>T2</td><td>T3</td><td>T4</td><td>T5</td><td>T6</td><td>T7</td><td>T8</td><td>T9</td></tr>
<tr><td>10</td><td>12</td><td>10</td><td>12</td><td>21</td><td>12</td><td>10</td><td>4</td><td>9</td></tr>
</table>

Note. T1, T2 ... T9 are themes of the thematic modules.

Table 10.1

System of evaluating the level of formed professional competencies

Professional competences		Week	Hours		Methods and forms of studies		EVALUATION of the level of formed competencies	
							Control forms	Maximum grade
1		2	3		4		5	6
Thematic module 1. Ecosystem level of matter organization and anthropogenic influence on the environment								**44**
E1	The ability to distinguish and characterize the object, subject, essence, basic stages of ecology development methods of modern ecology	1, 2	Class work	4	**Lecture**	**Theme 1.** Object, method, essence and tasks of ecology	Work during the lecture	2
				2	**Seminar**	**Theme of the seminar** "Object, method, essence and tasks of ecology" Discussion of reports and unformation on the following themes: 1 Basic stages of ecology development. 2. Object and subject of ecology. 3. Basic tasks of ecology	Active participation in the discussion of seminar questions, reports and information	3
			IWS	7	**Preparation of the material**	Search, selection and review of literature sources on the given themes	Checking hometask	5
						Preparation of reports, information on the theme		

Table 10.1 (continued)

1		2	3		4		5	6
E1	The ability to distinguish and characterize general conformities to the law of the development and interaction of the system "man – society – biota – environment"	3, 4	Class work	4	**Lecture**	**Theme 2.** Ecosystem level of matter organization	Work during the lecture	2
				2	**Seminar**	**Theme 2.** Ecosystem level of matter organization Discussion of reports and information on the following themes: 1.Ecological factors. 2. Concept of population, static and dynamic indexes of populations. 3. Basic ecosystems of the planet (biomes). 4. Practical value of ecology laws. Written test K-1	Active participation in the discussion of seminar questions, reports and information. Writing test K-1	5
			IWS	7.5	**Preparation of the material**	Search, selection and review of literature sources on the given themes	Checking hometask	5
						Preparation for the test		
						Preparation of reports, information on the theme		
		5,6	Class work	4	**Lecture**	**Theme 3.** The biosphere as the global ecosystem of the Earth. Global ecological problems	Work during the lecture	2

Table 10.1 (continued)

1		2	3		4		5	6
	The ability to distinguish and characterize the basic concepts of the doctrine about the biosphere and noosphere, of the biosphere structure, global problems of the biosphere			2	**Seminar**	**Theme 3:** The biosphere as the global ecosystem of the Earth. Global ecological problems Discussion of reports and information on the following themes: 1.The doctrine by V. I. Vernadsky about the biosphere and noosphere. 2. The biosphere structure. 3. The circulation of basic chemical elements and substances in the biosphere	Active participation in the discussion of seminar questions, reports and information	3
			IWS	7.5	**Preparation of the material**	Search, selection and review of literature sources on the given themes Preparation of reports, presentations, information on the theme	Checking hometask	5
	The ability to determine basic forms and peculiarities of the anthropogenic influence on the environment	7, 8	.Class work	4	**Lecture**	**Theme 4.** Anthropogenic influence on the environment	Work during the lecture	2
				2	**Seminar**	**Theme 4.** Anthropogenic influence on the environment. Discussion of reports and information on the following themes 1.Types of the environment contamination. 2. Influence of contaminating factors on the man, environment and objects of economic activity. 3. Ecological state of air, surface and underground waters, soils. 4.The exhaustion of natural resources. Written test K-2	Active participation in the discussion of seminar questions, reports and information. Writing test K-2	5

Table 10.1 (continued)

1		2	3		4		5	6
			IWS	7.5	**Preparation of the material**	Search, selection and review of literature sources on the given themes	Checking hometask	
						Preparation for the test		
						Preparation of reports, information on the theme		
Thematic module 2. Environment protection and rational nature management								**56**
E2	The ability to identify natural scientific and economic bases of the rational nature management, its operating economic mechanisms	9, 10	Class work	4	**Lecture**	**Theme 5.** Economic mechanisms of the environment protection and nature management	Work during the lecture	2
				2	**Seminar**	**Theme 5.** Economic mechanisms of the environment protection and nature management. Discussion of reports, presentations and information on the following themes: 1. Natural resources and natural terms. 2. Resource cycle. 3. Principles of rational nature management. 4. The essence of economic mechanisms of the environment prootection.	Active participation in the discussion of seminar questions, reports, presentations and information	14
			IWS	7.5	**Preparation of the material**	Search, selection and review of literature sources on the given themes	Checking hometask	5
						Preparation of reports, presentations in Power Point, information on the theme		
		11, 12	Class work	4	**Lecture**	**Theme 6.** Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine	Work during the lecture	2

Table 10.1 (continued)

1		2	3		4		5	6
E2	The ability to understand and effectively use basic normative documents and laws of Ukraine in the sphere of the protection of the natural environment and nature management			2	**Seminar**	**Theme 6.** Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine. Discussion of reports and information on the following themes: 1. The concept of the environment quality: essence, parameters, actuality. 2. The essence of the environment monitoring concept, its purpose and tasks. 3. The state system of monitoring the environment state in Ukraine. 4. The legislation in the sphere of setting norms of the environment quality: the standards concept, types of standards. Written test K-3	Active participation in the discussion of seminar questions, reports and information. Writing test K-3	5
			IWS	7.5	**Preparation of the material**	Search, selection and review of literature sources on the given themes	Checking hometask	5
						Preparation for the test		
						Preparation of reports, information on the theme		
	The ability to determine optimum ways of the environment quality management	13, 14	Class work	4	**Lecture**	**Theme 7.** Ecological management and marketing	Work during the lecture	2
				2	**Seminar**	**Theme 7.** Ecological management and marketing. Discussion of reports and information on the following themes: 1. Principles and elements of the system of ecological management. 2. International standards in the system of ecological management. 3. Ecological management at enterprises. 4. Ecological marketing	Active participation in the discussion of seminar questions, reports and information	3

Table 10.1 (continued)

1		2	3		4		5	6
			IWS	7	**Preparation of the material**	Search, selection and review of literature sources on the given themes Preparation of reports, information on the theme	Checking hometask	5
E3	The ability to distinguish and characterize basic concepts and principles of ecological safety	15	Class work	2	**Lecture**	**Theme 8.** Ecological safety and ecological risks	Work during the lecture. Written test K-4	2
			IWS	4	**Preparation of the material**	Search, selection and review of literature sources on the given themes Preparation for the test	Checking hometask	2
		16	Class work	2	**Lecture**	**Theme 9.** World ecological policy. International integration in the sphere of ecology	Work during the lecture	1
				2	**Seminar**	**Theme 9.** World ecological policy. International integration in the sphere of ecology		

Table 10.1 (the end)

1		2	3		4		5	6
	The ability to determine basic principles of world ecological policy and international cooperation in the sphere of ecology, principles of international ecological law					Discussion of reports and information on the following themes: 1. Criteria and principles of steady development. 2. International ecological organizations and principles of international cooperation in the sphere of ecology. 3. Basic directions and forms of the international cooperation in the sphere of ecology. 4. The participation of Ukraine in the international ecological cooperation. Written test K-5	Active participation in the discussion of seminar questions, reports and information. Writing test K-5	5
			IWS	4.5	**Preparation of the material**	Search, selection and review of literature sources on the given themes	Checking hometask	3
						Preparation for the test		
						Preparation of reports, information on the theme		
All the hours				**108**	**General maximal number of grades in the academic discipline**			**100**
including:								
class work				**48**	44.4 %		Current control	**100**
independent work				**60**	55.6 %		Final control	**100**

The maximum number of grades, which a student can accumulate during a week according to forms and methods of studies, is given in Table 10.3.

Table 10.3

Distribution of grades according to weeks

Themes of the thematic module			Lectures	Seminars	Home task	Presentation	Written test	Total
Thematic module 1. Ecosystem level of matter organization and anthropogenic influence on the environment	**Theme 1**	1 week	1	3	3			7
		2 week	1		2			3
	Theme 2	3 week	1	3	3			7
		4 week	1		2		2	5
	Theme 3	5 week	1	3	3			7
		6 week	1		2			3
	Theme 4	7 week	1	3	3			7
		8 week	1		2		2	5
Thematic module 2. Environment protection and rational nature management	**Theme 5**	9 week	1	3	3			7
		10 week	1		2	11		14
	Theme 6	11 week	1	3	3			7
		12 week	1		2		2	5
	Theme 7	13 week	1	3	3			7
		14 week	1		2			3
	Theme 8	15 week	1		3		1	5
	Theme 9	16 week	1	3	2		2	8
Total			16	24	40	11	9	100

The final assessment grade in the academic discipline is determined according to the Temporal provision "About the order of the evaluation of the

results of students' studies according to the accumulative grade and rating system" of Simon Kuznets KhNUE (Table 10.4).

Table 10.4

Evaluation scale: national and ECTS

<table>
<tr><td rowspan="2">The sum of grades for all types of educational activity</td><td rowspan="2">Evaluation according to ECTS</td><td colspan="2">Evaluation according to the national scale</td></tr>
<tr><td>for the examination, course project (paper), practice</td><td>for the test</td></tr>
<tr><td>90 – 100</td><td>A</td><td>excellent</td><td>passed</td></tr>
<tr><td>82 – 89</td><td>B</td><td rowspan="2">good</td><td rowspan="4"></td></tr>
<tr><td>74 – 81</td><td>C</td></tr>
<tr><td>64 – 73</td><td>D</td><td rowspan="2">satisfactory</td></tr>
<tr><td>60 – 63</td><td>E</td></tr>
<tr><td>35 – 59</td><td>FX</td><td rowspan="2">unsatisfactory</td><td rowspan="2">not passed</td></tr>
<tr><td>1 – 34</td><td>F</td></tr>
</table>

Grades according to this scale are put into the register of accounting the progress in studies, individual curriculum of a student, and other academic records.

11. Recommended Literature

11.1. Main

1. Білявський Г. О. Основи екології: теорія та практикум / Г. О. Білявський, Л. І. Бутченко. – К. : Либра, 2004. – 368 с.

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Supplement

Supplement A

Table A 1

Structure of constituents of professional competencies in the academic discipline "Ecology" according to the National scope of qualifications of Ukraine

Constituents of competence which is formed within the framework of the theme	Minimal experience	Knowledge	Ability	Communications	Independence and responsibility
1	2	3	4	5	6
Theme 1. Object, method, essence and tasks of ecology					
To distinguish and characterize the basic paradigms of science "Ecology" for application in the professional activity	Essence of ecology as a science, its object, subject, tasks and basic stages of development	Knowledge of object, subject, tasks, methods, structure of ecology as a science	To identify and to analyze key ecological issues and ecological state at an enterprise	To form effectively the communication strategy concerning the development and implementation of optimum decisions for solving ecological problems	Responsibility for exact authentication of key ecological problems and ecological state at an enterprise; working out and implementing a proper decision

Table A 1 (contunued)

1	2	3	4	5	6
Theme 2. Ecosystem level of matter organization					
To distinguish and characterize general conformities to the law of development and co-operation of the system "man – society – biota –environment"	Essence of the concept "Ecosystem", classification of ecosystems. Natural environment and ecological factors. Laws of ecology	Knowledge of the concept of the natural environment, its kinds and ecological factors; the concept "Ecosystem" classifications of ecosystems; basic laws of ecology	To conduct the decomposition of the ecological problem. Formulate the priorities of goals and criteria of taking decisions on ecological issues	To present the results of determining the most effective decision on ecological issues	Responsibility for the accuracy and correctness of decisions taken on ecological issues and terms of their implementation
Theme 3. The biosphere as the global ecosystem of the Earth. Global ecological problems					
To distinguish and characterize basic concepts of the doctrine about the biosphere and noospher, the biosphere structure, global problems of the biosphere	Description of general properties of the biosphere, the biosphere structure. Ways of solving global ecological problems	Knowledge of the essence of the term "biosphere", the doctrine by V. I. Vernadsky about the biosphere and noosphere, the biosphere structure, the essence and ways of solving global problems of the biosphere	To carry out the choice of method tools for solving specific ecological problems on macro- and micro-levels	To present the results of the formation and implementation of solving the specific ecological problem on macro- and micro-levels	To take independently effective decisions and take responsibility for correctness and adequacy of the developed decisions of specific ecological problems

Table A 1 (contunued)

1	2	3	4	5	6
Theme 4. Anthropogenic influence on the environment					
To determine basic forms and peculiarities of the anthropogenic influence on the environment	The essence of the environment contamination, its kinds; the influence of different industries on the state of the environment	Knowledge of the global character of the influence of the anthropogenic contamination on the biosphere and separate ecosystems; kinds of the environment contamination	To apply ecological knowledge for the analysis and estimation of the ecological and economic state of an enterprise, settlement, city, region, country	To form effectively the communication strategy concerning carrying out selective investigations which characterize the ecological state of a settlement, city, region, country	To take effective decisions concerning ecological problems and take responsibility for trustworthiness and exactness of the results
Theme 5. Economic mechanisms of the environment protection and nature management					
To identify natural scientific and economic bases of the rational nature management, its operating economic mechanism	The definition of concepts "the protection of the natural environment" and "rational nature management" and basic principles of their introduction	Knowledge of the classification of natural resources; modern ecological requirements to the activity of man, principles of rational nature management; methods of carrying out the nature protection activity	To introduce scientifically grounded methods of the nature protection activity management	To present the results of the application of scientifically grounded methods of the protection of the natural environment and the rational nature management	To take independently effective decisions for carrying out the nature protection activity. To take responsibility for correctness and adequacy of the developed models

Table A 1 (contunued)

1	2	3	4	5	6
Theme 6. Ecological monitoring of the environment. The legal regulation of ecological relations in Ukraine					
To understand and effectively use basic normative documents and laws of Ukraine in the sphere of the protection of the natural environment and nature management	The essence of the management of quality of the natural environment. Ecological monitoring and its tasks. The legal regulation of ecological relations in Ukraine	Knowledge of the criteria of estimation of the quality of the natural environment, standards of quality of the natural environment, bases of the legislation in the sphere of the environment protection	To use effectively the basic methods of the management of quality of the environment and rational nature management	To present the results of the activity in ecological monitoring of the environment and the environment quality management. The capacity for team co-operation in the process of developing decisions on ecological issues	To take decisions for the management of quality of the natural environment according to the current legislation in the sphere of the environment protection and take responsibility for the exactness and correctness of the results
Theme 7. Ecological management and marketing					
To determine the optimum ways of the management of the environment quality	The essence, aims, methods and objects of ecological management and ecological marketing	The knowledge of the concepts, subject and functions of ecological management and ecological marketing	To formulate practical suggestions for improving the state of the natural environment and the nature management rationalization	To present the results of using scientific principles and methods of ecology in the environment quality management	To take effective administrative decisions for improving the state of the natural environment and the nature management rationalization

Table A 1 (the end)

1	2	3	4	5	6
Theme 8. Ecological safety and ecological risks					
To distinguish and characterize basic concepts and principles of ecological safety	The definition of the concepts "Ecological safety" and "Ecological risk". The constituents of the ecological safety	The knowledge of the basic concepts and principles of the ecological safety; kinds, sources and consequences of ecological danger; the estimation methods and the principles of the management of the ecological risk	To estimate the level of the ecological safety of an enterprise, city, region, state	To present the results of evaluating the level of the ecological safety of an enterprise, city, region, state	To take decisions for increasing the level of the ecological safety of an enterprise, city, region, state. The responsibility for the exactness and correctness of the results
Theme 9. World ecological policy. International integration in the sphere of ecology					
To determine the basic principles of the world ecological policy and the international cooperation in the sphere of ecology, the principles of the international ecological law	The essence and importance of the world ecological policy and the international integration in the sohere of ecology	The knowledge of the principles of the world ecological policy and the international cooperation in the sphere of ecology, the principles of the international ecological law, of the contribution of Ukraine into the international cooperation in the sphere of ecology	To plan and work out economically grounded measures in the environment protection and the rational use of natural resources	To form effectively the communication strategy of the development and implementation measures for the environment protection and the rational use of natural resources	Ther responsibility for the exactness and correctness of the taken decision

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EDUCATIONAL EDITION

Syllabus
of the academic discipline
"ECOLOGY"
for full-time students
of training direction 6.140103 "Tourism"

Compiled by O. **Slavgorodska**

Editorial director **G. Nazarova**

Editor **Z. Zobova**
Proof-reader **M. Promskiy**

НАВЧАЛЬНЕ ВИДАННЯ

Робоча програма
навчальної дисципліни
"ЕКОЛОГІЯ"
для студентів напряму підготовки 6.140103 "Туризм"
денної форми навчання

(англ. мовою)

Укладач **Славгородська** Ольга Юріївна

Відповідальний за випуск **Назарова Г. В.**

Редактор **Зобова З. В.**
Коректор **Промський М. Н.**

План 2014 р. Поз. № 172.
Підп. до друку Формат 60 х 90 1/16. Папір MultiCopy. Друк Riso.
Ум.-друк. арк. 3,25. Обл.-вид. арк. 4,06. Тираж прим. Зам. №

Видавець і виготівник – видавництво ХНЕУ ім. С. Кузнеця, 61166, м. Харків, пр. Леніна, 9-А

Свідоцтво про внесення до Державного реєстру суб'єктів видавничої справи ***Дк № 481 від 13.06.2001 р.***