EDUCATIONAL-METHODOLOGICAL COMPLEX
OF DISCIPLINE

“ENVIRONMENTAL AUDIT AND INSPECTION”

For speciality 6.070800 "Ecology and environment protection"

KYIV – 2016
WORKING EDUCATIONAL PROGRAMME
OF DISCIPLINE

“ENVIRONMENTAL AUDIT AND INSPECTION”

For speciality 6.070800 "Ecology and environment protection"

Educational-qualification level "Bachelor of Science Degree"
Semester - 1
Distribution of semester's time:
1 semester - 60 hours.
Number of weeks - 15
Number of ECTS credits - 2
Lectures - 15 hours.
Seminars – 15 hours.
Independent work under the supervision of lecturer -0 hours.
Independent work - 30 hours.
Final form of control: test

KYIV - 2016
Working educational programme was created by PhD (in Agriculture), associated professor Nataliya M. Bilyera on the basis of typical educational programs for higher educational institution of III-IV levels of accreditations and speciality 6.070800 "Ecology and environment protection". This is “Environmental audit and inspection” for training of specialists of direction 0708 "Ecology".

Working educational programme was discussed on meeting of Ecology of agrosphere and ecology control department Report № __ from 2016.__.____.

Head of department,
PhD (in Agriculture), professor Volodymyr M. Chaika

Approved by the methodological committee of the Faculty of Plant Protection, Biotechnology and Ecology

Head of the committee M.M. Dolya

Author: Nataliya M. Bilyera, associated professor of Ecology of Agrosphere and Ecology Control Department

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FOREWORD

As people have become more aware of threats to the world’s environment, an awareness of the responsibilities of industry and of all levels of government to address environmental issues has also increased. Public scrutiny, not only from individual citizen or groups but on the part of financial institutions as well, has increasingly focused on issues of accountability for environmental issues. This scrutiny has given an added impetus to efforts by government and business to incorporate environmental concerns into their planning and policy making activities. As a result, environmental regulation by both national and local authorities has expanded significantly – resulting in new or additional compliance measures, and costs – for both the public and private sectors. Actually, this regulation is performed by environmental audit and inspection.

In educational course "Environmental audit and inspection" will be studied questions how to conduct audit or inspection and create some proposals to make any activity environmental friendly.

In result of studied of this subject matter student must:

to know:
- Theoretical principles and methodological basics of environmental audit (EA) and inspection.
- Tasks of modern science about rational management of nature, and their methods, problems and perspectives.
- Conception of EMAS.
- Optimization of management of nature in consideration of basic ecological laws with conducting of EA
- Principles, forms and methods of environmental auditing.
- Normatively-legislative basics of environmental audit and inspection
- Conception of sustainable development of society and role of EA in it.

to be able:
- to use principles, forms and methods of EA.
- to foresee of consequences of destructive unconsidered economical activities of human on environment and calculate the tallages.
- to take optimal technical, technological and designed decisions, which directed on increasing of ecological safety.
- to plan, conduct and report on EA.
- to introduce of innovation in environmental management after auditing.
- to determine of ecological aspects of enterprises activity and priorities, to develop of programmes of ecological actions.

For successful learning of subject "Environmental audit and inspection" students must to listen to courses of that fundamental and special subjects as: basics of ecology, environmental monitoring, balance management (natural recourses).
After successful mastering discipline “Environmental audit and inspection” students could follow such fundamental and special courses: ecological expertise, environmental management, the ecological politics.

According to the typical curriculum on studying of the course it is removed 60 hours, from them 15 hours of lectures, 15 hours of practical employment, and 30 hours of independent work of the student.

The control of knowledge and skills of students is carried out in the form of test.
COURSE CONTENT
“ENVIRONMENTAL AUDIT AND INSPECTION”

THEORETICAL PART

THE SUBSTANTIAL MODULE 1
Lecture 1: Introduction to Environmental Auditing. Its Main Tasks and Normative Documents (2 hours).
• 1. Definition of Environmental Auditing
• 2. Audit Objectives, Responsibilities and Issues
• 3. Why do we need to do EA?
• 4. Recommended list

Lecture 2. History of Environment Audit and its types (2 hours).
• 1. Background of EA.
• 2. The 4th E
• 3. EA classification
• 4. Readings and HT.

Lecture 3. Environment Auditing Planning (2 hours).
• 1. General planning
• 2. Defining audit objectives, scope and criteria
• 3. Selecting the auditing team

2. Interviewering and other type of communication at on-side audit.
3. EA of Chernobyl shelter and Dnister river.
4. EA of water in India.

Lecture 5. Reporting EA findings (2 hours).
1. The structure of report.
2. The most important parts of the report.
3. Writing the report and making presentation.

THE SUBSTANTIAL MODULE 2
Lecture 6. Inspecting as a tool of environment control. (2 hours).
1. The structure, role and history of inspection in Ukraine.
2. The main tasks and responsibilities of inspection.
4. Related readings.

**Lecture 7. Case studies of inspection (2 hours).**
1. Some features of water, land (soil) air inspection.
2. Inspection in Ukraine.
3. Inspection in EU and other countries.

**THEMES OF PRACTICAL PART OF COURSE**

“ENVIRONMENTAL AUDIT AND INSPECTION”

THE SUBSTANTIAL MODULE 1

**Practical work №1.** Terms and definitions in EA (2 hours)

**Practical work №2.** Introduction to ISO 14001 (4 hours).
1. ISO 14001 application
2. The EMS Model
3. ‘PDCA’ Cycle
4. Sequence & interaction of EMS processes

**Practical work №3.** Introduction to ISO 19011 (2 hours).
1. ISO 19011 application and structure.
2. Selecting the auditing team and planning.
3. Document review and other checking activities.
4. Reporting, improving and follow up activities.

THE SUBSTANTIAL MODULE 2

**Practical work №4.** Waste management audit (2 hours).
1. About waste. Kinds of waste
2. Impact of waste on health and environment
3. Waste Management. Waste prevention
4. Major audit issues in management of waste
5. Compliance Audit of waste issues

**Practical work №5.** Energy audit (2 hours).
1. Energy sources.
2. Impact of high energy consumption on health and environment
4. Major audit issues in energy management
5. Compliance Audit of energy issues
Practical work №6. Making the report on the audit (3 hours).
1. ISO 19011 application and structure.
2. Selecting the auditing team and planning.
3. Document review and other checking activities.
4. Reporting, improving and follow up activities.
INDEPENDENT WORK  
(30 hours)

**Calculation of tallage (dues) for environmental pollution**

- **Task:** To calculate tallage rate for environmental pollution (according to variant 1-30). Tables 1-3 are for additional information and table 4 is basic. Differences between variants within 1-5 are cities, which are given in the brackets.

- **Teacher supervision** If needed you can come to the teacher and ask about calculation. For additional information you can download the enactment of Cabinet of Ministers of Ukraine, 01.03.99 №303 from relevant web site.

- **Submit** report on calculation task, where first page will be front (with your name, group, faculty and other information). On another 1-2 pages describe location (with water basins) and industrial situation in the given city or town (e.g. branches of industry). Than perform your table with calculated tallages for environmental pollution. Afterwards write your judgment about current situation on this enterprise (1-2 pages) and make some proposal how to better environmental situation in this region.

- **The tasks will be given by teacher.**
MODULAR SYSTEM OF TEACHING OF COURSE AND RATING OF ESTIMATION OF STUDENTS’ KNOWLEDGES

According to «Regulations about a credit-modular system of training in NULES» a teaching material of discipline «Environmental Audit And Inspection» is divided in 2 substantial modules, with volume 1 credits each.

Distribution of teaching materials of course on substantial modules

<table>
<thead>
<tr>
<th>Themes of lectures</th>
<th>Hours</th>
<th>Themes of practical employment</th>
<th>Hours</th>
<th>Independent work</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
</tbody>
</table>

**The substantial module 1**

- Introduction to Environmental Auditing. Its Main Tasks and Normative Documents: 2
- Terms and definitions in EA: 2
- History of Environment Audit and its types: 2
- Introduction to ISO 14001: 4
- Environment Auditing Planning: 2
- Environment Auditing Conducting. Case studies in Ukraine and abroad: 2
- Introduction to ISO 19011: 2
- Reporting EA findings: 2

**The substantial module 2**

- Inspecting as a tool of environment control: 2
- Waste management audit: 4
- Case studies of inspection: 3
- Energy audit: 4
- Making the report on the audit and inspection: 2

**Total hours – 60** 15 15 30

The rating of the student from mastering of course is defined on 100 mark scale. It consists of a rating from study, which estimates in 70 points, and a rating from examination - 30 points. Each substantial module is estimated in 100 mark scale too. The form of the control of knowledge from the substantial modules is performance of calculation work and tests.
The rating can influence a rating from study under the decision of faculty from additional work - up to 20 points and a rating penalty (with a negative sign) - up to 5 points.

The rating of the student from study $R_{НР}$ is defined under the formula

$$R_{НР} = \frac{0.7 \cdot (R^{(1)}_{OM} + R^{(2)}_{OM})}{2} + R_{ДР} - R_{ШТР},$$

Where $R^{(1)}_{OM}$, $R^{(2)}_{OM}$ rating estimations according to 1-st and 2-nd substantial modules behind a 100-mark scale;

$R_{ДР}$, $R_{ШТР}$ accordingly a rating from additional work and a rating penal.

_Students who have collected from study of 60 and more points, can not make examination, and receive an examination estimation "Automatically", according to the collected quantity of the points transferred in a national estimation and an estimation according to tab. 2.6. In that case the rating of the student from discipline $R_{ДИС}$ is equaled to its rating from study

$$R_{ДИС} = R_{НР}.$$

If the student wishes to increase the rating and to improve an estimation from discipline, he should pass semestrial certification - to pass examination. Last without fail there pass students who of study have typed less, than 60 points. For the admission to certification the student should type not less than 60 points from each substantial module, and in general it is not less, than 42 points from study.

The rating of the student from certification $R_{AT}$ is defined on a 100-mark scale.

The rating of the student from discipline $R_{ДИС}$ is estimated under the formula

$$R_{ДИС} = R_{НР} + 0,3 R_{AT}.$$

The rating of the student from discipline is translated in a national estimation and an estimation according to the table.
NULES of Ukraine

**COORDINATION PROTOCOL**
Of working educational programme of course
“ENVIRONMENTAL AUDIT AND INSPECTION”
With others courses of specialty 6.040106 “Ecology, environmental protection and balanced nature"

<table>
<thead>
<tr>
<th>Course and its parts, which are preceding</th>
<th>Name of lector and its academic degree</th>
<th>Signature</th>
<th>Course and its parts, which are following</th>
<th>Name of lector and its academic degree</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Balanced nature management (Natural Resources)</td>
<td></td>
<td></td>
<td>Environmental expertise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fundamentals of ecology</td>
<td></td>
<td></td>
<td>Environmental management</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental monitoring</td>
<td></td>
<td></td>
<td>Environmental politics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Head of Educational-methodological scientific council of Faculty of Plant Protection, Biotechnology and Ecology  
M.M. Dolya
NULES of Ukraine

STRUCTURALLY LOGIC SCHEME

Tution of course ENVIRONMENTAL AUDIT AND INSPECTION

Course and its parts, which are preceding

Balanced nature management (Natural Resources)
Fundamentals of ecology
Environmental monitoring

“ENVIRONMENTAL AUDIT AND INSPECTION”

Course and its parts, which are following

Environmental expertise
Environmental politics
Environmental management
WORKING PROGRAM
NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE
Ecology of Agrosphere and Ecology Control Department
(10.01.02)

"TO APPROVE"

of Plant Protection, Biotechnology and Ecology
M.M. Dolya
"___" ____________ 2016

THE CALENDAR THEMATIC PLAN
from course “ENVIRONMENTAL AUDIT AND INSPECTION”
For preparation of experts in 6.040106 "Ecology, environmental protection and balanced nature"
On 1st-semester 2016/2017

<table>
<thead>
<tr>
<th>Topic of lectures</th>
<th>Hours</th>
<th>Topic of practice works/seminar</th>
<th>Hours</th>
<th>Literature</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The substantial module 1</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Introduction to Environmental Auditing, Its Main Tasks and Normative Documents</td>
<td>2</td>
<td>Terms and definitions in EA 2</td>
<td>2</td>
<td>1-2</td>
</tr>
<tr>
<td>History of Environment Audit and its types</td>
<td>2</td>
<td>Introduction to ISO 14001 4</td>
<td></td>
<td>2-3</td>
</tr>
<tr>
<td>Environment Auditing Planning</td>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environment Auditing Conducting. Case studies in Ukraine and abroad</td>
<td>2</td>
<td>Introduction to ISO 19011 2</td>
<td></td>
<td>1,3</td>
</tr>
</tbody>
</table>
### The substantial module 2

<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reporting EA findings</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>15</strong></td>
<td><strong>15</strong></td>
</tr>
<tr>
<td>Inspecting as a tool of environment control.</td>
<td>2</td>
<td>1-3</td>
</tr>
<tr>
<td>Waste management audit</td>
<td>2</td>
<td>1-3</td>
</tr>
<tr>
<td>Case studies of inspection</td>
<td>3</td>
<td>1-3</td>
</tr>
<tr>
<td>Energy audit</td>
<td>2</td>
<td>1-3</td>
</tr>
<tr>
<td>Making the report on the audit and inspection</td>
<td>3</td>
<td>1-3</td>
</tr>
</tbody>
</table>

**The maximal rating: 100 points.**

Approximate criteria of estimation of knowledge depending on the collected amount of points from greatest possible in %:

- **Excellent**: 90–100 % – **90–100 points**
- **Good**: 75–89 % – **75–89 points**
- **Satisfactory**: 60–74 % – **60–74 points**
- **Unsatisfactory**: less 60% – less **60 points**

**Recommended literature:**


Lecturer of course ___________ Nataliya M. Bilyera

Head of department _____________ Volodymyr M. Chaika

Results of verification of the calendar thematic plan ________________________________
List of recommended literature

In English


In Ukrainian


In Russian

Normative documents

4. ДСТУ ISO 14001-97. Системи управління навколишнім середовищем. Склад та опис елементів і настанови щодо їх застосування”.
5. ДСТУ ISO 14004-97. Системи управління навколишнім середовищем. Загальні настанови щодо принципів управління, систем та засобів забезпечення.
7. ДСТУ ISO 14012-97. Настанови, щодо здійснення екологічного аудиту. Кваліфікаційні вимоги до аудиторів з екології.

**Web sources**