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Scientific principles of biodiversity conservation

The course is proposed for students in the academic year 2020-2021 as an optional one

Fall semester, 2020-2021

Cooordinator	**Oksana Maryskevych**
Credits	4 ECTS (normative course), 60 in-class hours
Lecturers	**Volodymyr Kyyak** (Institute of Ecology of the Carpathians National Academy of Science of Ukraine, Ukraine **Oksana Maryskevych** (Institute of Ecology of the Carpathians National Academy of Science of Ukraine, Ukraine) **Andri-Taras Bashta** (Institute of Ecology of the Carpathians National Academy of Science of Ukraine, Ukraine)
Level	PhD
Host institution	**Institute of Ecology of the Carpathians National Academy of Science of Ukraine,** Department of Ecosystemology, Department of Population Ecology
Course duration	November 1, 2020 – Junuare 31, 2021

Summary

This 4 ECTS course is designed to provide applicants with the necessary theoretical knowledge on conservation, protection and restoration of biodiversity at different levels of organization of living organisms under the influence of natural and anthropogenic factors, as well as provide skills of the main modern methods of biodiversity analysis, assessment and practical environmental problems.

Target student audiences

PhD students, study program Ecology, Natural Sciences (Code No. 103)

Prerequisites

Required courses (or equivalents):

- Phylosophy of Science;
- Science Methodology

Aims and objectives

The aim of the course is to form a set of knowledge and competencies about theoretical knowledge on conservation, protection and restoration of biodiversity at different levels of organization of living organism under the influence of natural and anthropogenic factors, as well as provide skills of the main modern methods of biodiversity analysis, assessment and practical environmental problems.

In addition, it introduces students to the EU environmental policy framework and institutions of environmental governance.

General learning outcomes:

By the end of the course, successful students will:

know:

- the main current problems of modern ecology;
- the action of environmental factors at different levels of organization of living things;
- priority areas of research in the field of ecology and environmental protection;
- threats to biodiversity in the conditions of anthropogenic impact;
- problems of sustainable nature management, conservation of biotic and landscape biodiversity;
- current state and trends of international cooperation in the field of environmental protection;
- theoretical bases of conservation, protection and restoration of biodiversity and ways of their application in practice;
- environmental policy of Ukraine and the European Union

be able to:

- highlight the main environmental issues at the global, national, regional and local levels;
- select optimal methods for studying biodiversity;
- have a methodology for monitoring biodiversity;
- apply appropriate techniques to analyze biodiversity and assess its status;
- assess and forecast the state of biodiversity protection;
- apply the acquired knowledge during field research and examinations.

Overview of sessions and teaching methods

The course will make most of interactive and self-reflective methods of teaching and learning and, where possible, avoid standing lectures and presentations. The course combines interactive group and individual self-reflective methods of teaching and learning. The course includes in-class work (lectures, practical works and seminars) and independent work.

There are three sections

Section 1. Protection and restoration of species and population diversity

Topic 1. Levels of living things organization: personal, population and ecosystem. Autecological bases of biodiversity conservation.

Topic 2. Population as a form of a species existence, the main evolutionary unit, the object of exploitation and protection.

Topic 3. Protection and restoration of species and population diversity on the basis of modern conservation approaches and methods

Section 2. Principles of conservation of species and population diversity

Topic 1. Principles of conservation of species and population diversity in situ and ex situ. Scientific aspects of introduction and reintroduction.

Topic 2. Passive and active methods of conservation of rare groups and ecosystems. Monitoring. Restoration of groups.

Topic 3. Habitat and biotope concepts in environmental practice. Biodiversity loss at different levels of living organization.

Section 3. Aspects and directions of environmental protection in Ukraine and abroad

Topic 1. Protected areas, legal bases of nature protection, aspects and directions of environmental protection in Ukraine and abroad

Topics of practical works and seminars

1. Autecological bases of biodiversity conservation
2. Population bases of biodiversity conservation
3. Problems of sustainable nature management protected area
4. Redional aspects of introduction and reintroduction
5. Passive and active methods of conservation of rare groups of species in Ukrainian National Nature Park
6. Habitat and biotope concepts in environmental practice of conservation of rare groups of species
7. Problems of invasive species of protected areas, successful examples of solutions
8. Ecosystem services of protected territories, assessment methods

Course workload

The table below summarizes course workload distribution:

Activities	Learning outcomes	Assessment	Estimated workload (hours)
In-class activities			
Lectures	Understanding theories, concepts, methodology and tools	Class participation	28
Practical works	Understanding current challenges of modern ecology, the main trends of man-made changes in environmental components, environmental policy of Ukraine and the EU	Class participation and preparedness for discussions	16
Seminars	Understanding of key topics proposed for analysis and discussion	Class participation and preparedness for assignments	16
Independent work			
Individual assignments: - Development of presentations - Writing paper assignments	Ability to find related literature and data, to interpret data, to identify factors, to perform analysis and visualization of information	Quality of presentations and paper assignments	30
Reading and discussion of assigned papers for seminars and preparation for	Find related literature and data, interpret data, use the concepts, tools and methods covered in the course, and draw t relevant	Quality of developed ICT tools and their presentation.	30

lectures, oral interviews and tests	conclusions. Familiarity with and ability to critically and creatively discuss key concepts	Class participation, creative and active contribution to discussion	
Total			***120***

Grading

The following table defines the criteria for evaluating the student's work in studying the materials of the course. As a result, the student is able to get a maximum score of 100 points. The minimum number of points required is 50 points.
In the course of studying the course a student receives points for performing various tasks.

Educational activity	**Max**	**Min**
In class disscuddaion during lectures	6	4
Practical work 1	5	2
Practical work 2	5	2
Practical work 3	5	2
Practical work 4	5	2
Seminar 1	6	3
Seminar 2	6	3
Seminar 3	6	3
Seminar 4	6	3
Final control	50	25
Total	100	50

At the end of the course the student will have an exam.
Grading system is presented below

Score	**Mark**
90-100	Excellent
70-8-	Good
50-69	Satisfactory
1-49	No passed

Course schedule

Day	**Time**	**Topic**	**Lecturer**
October 1, Tuesday	15:05-16:25 16:40-18:00	Lecture 1 . Levels of living things organization: personal, population and ecosystem Autecological bases of biodiversity conservation.	Volodymyr Kyyak
October 8,	15:05-16:25	Practical work 1. Autecological bases of	Volodymyr Kyyak

Tuesday	16:40-18:00	biodiversity conservation	
October 18, Tuesday	15:05-16:25 16:40-18:00	Lecture 2. Population as a form of a species existence, the main evolutionary unit, the object of exploitation and protection	Volodymyr Kyyak
October 28, Tuesday	15:05-16:25 16:40-18:00	Practical work 2. Population bases of biodiversity conservation	Volodymyr Kyyak
November 05, Tuesday	15:05-16:25 16:40-18:00	Lecture 3. Protection and restoration of species and population diversity on the basis of modern conservation approaches and methods	Volodymyr Kyyak
November 12, Tuesday	15:05-16:25 16:40-18:00	Seminar 1. Problems of sustainable nature management protected area	Oksana Maryskevych
November 19, Tuesday	15:05-16:25 16:40-18:00	Lecture 5. Principles of conservation of species and population diversity in situ and ex situ. Scientific aspects of introduction and reintroduction	Andri-Taras Bashta
November 26, Tuesday	15:05-16:25 16:40-18:00	Practical work 3.Redional aspects of introduction and reintroduction	Oksana Maryskevych
December 03, Tuesday	15:05-16:25 16:40-18:00	Lecture 6. Passive and active methods of conservation of rare groups and ecosystems. Monitoring. Restoration of groups	Oksana Maryskevych
December 10, Tuesday	15:05-16:25 16:40-18:00	Practical work 4. Passive and active methods of conservation of rare groups of species in Ukrainian National Nature Park	Oksana Maryskevych
December 17, Tuesday	15:05-16:25 16:40-18:00	Lecture 7. Protected areas, legal bases of nature protection, aspects and directions of environmental protection in Ukraine and abroad	Oksana Maryskevych
December 24, Tuesday	15:05-16:25 16:40-18:00	Seminar 2. Habitat and biotope concepts in environmental practice of conservation of rare groups of species	Andri-Taras Bashta
January 15, Tuesday	15:05-16:25 16:40-18:00	Seminar 3. Problems of invasive species of protected areas, successful examples of solutions	Andri-Taras Bashta
January 22, Tuesday	15:05-16:25 16:40-18:00	Seminar 4. Ecosystem services of protected territories, assessment methods	Oksana Maryskevych

Course assignments

The course includes the following practical works and seminars:

Topic Number of hours	Topic Number of hours
Practical work 1. Autecological bases of biodiversity conservation	4

Practical work 2. Population bases of biodiversity conservation	4
Practical work 3.Redional aspects of introduction and reintroduction	4
Practical work 4. Passive and active methods of conservation of rare groups of species in Ukrainian National Nature Park	4
Seminar 1. Problems of sustainable nature management protected area	4
Seminar 2. Habitat and biotope concepts in environmental practice of conservation of rare groups of species	4
Seminar 3. Problems of invasive species of protected areas, successful examples of solutions	4
Seminar 4. Ecosystem services of protected territories, assessment methods	4

Literature

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