

**ECOLOGY**  
COURSE SYLLABUS

<b>Code and name of specialty</b>	073 – Management	<b>Institute</b>	Institute of Education and Science of Mechanical Engineering and Transport
<b>Program name</b>	Management of Organizations and Administration / Business Administration	<b>Department</b>	Chemical Engineering and Environmental Protection
<b>Type of program</b>	Educational and Professional	<b>Language of instruction</b>	English / Ukrainian

**LECTURER**

Tetiana Tykhomyrova, [tetiana.tykhomyrova@khpi.edu.ua](mailto:tetiana.tykhomyrova@khpi.edu.ua)



PhD, Associate Professor, Associate Professor of Chemical Engineering and Environmental Protection Department (NTU "KhPI").  
Work experience - 12 years. Authored and co-authored over 50 scientific and educational works. Fluent in English and Ukrainian.  
Courses: Sustainable Development, Grant writing and International Cooperation in Ecology, Hydrology, Soil Science,

**GENERAL DESCRIPTION OF THE COURSE**

<b>Summary</b>	This course is based on environmental knowledge acquisition for individual active environmental position formation that can be used in professional activities		
<b>Course objectives</b>	<ul style="list-style-type: none"> <li>- to format knowledge, skills and abilities of interaction laws between living matter and the environment and interaction between organisms at the global, regional and local levels.</li> <li>- to format understanding the causes and mechanisms of changes in the environment under human impact and the need to form a sustainable economic development.</li> <li>- to develop ecological thinking</li> </ul>		
<b>Types of classes and control</b>	Lectures, workshops, consultations. The course ends with a final pass		
<b>Term</b>	5		

<b>Student workload (credits) / Type of course</b>	5 / Optional	<b>Lectures (hours)</b>	16	<b>Workshops (hours)</b>	32	<b>Self-study (hours)</b>	102
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**Program** GC02. The ability to maintain and to increase the moral, cultural, scientific values and to increase achievements of society by

<b>competences</b>	<p>understanding the history and patterns of data domain development, its place in the overall knowledge system about nature and society and in the development of society, techniques, and technologies, to use different types and forms of motor activity for recreation and healthy lifestyles.</p> <p>GC15. The ability to act on the basis of ethical grounds (reasons).</p> <p>SC06. The ability to act socially responsible and consciously.</p> <p>SC13. To understand the principles and rules of law and to use them in a professional activity.</p>
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<b>Learning outcomes</b>	<b>Teaching and learning methods</b>	<b>Forms of assessment (continuous assessment CAS, final assessment FAS)</b>
LO 02. To keep moral, cultural, scientific values and to increase achievements of society, to use different types and forms of effective activity for maintaining a healthy lifestyle.	Interactive lectures with presentations, discussions, workshops.	Written assignment (CAS), practical assessment (CAS), online tests (FAS)
LO 08. To apply management methods to ensure the effectiveness of the organization.	Interactive lectures with presentations, discussions, workshops, teamwork	Written assignment (CAS), practical assessment (CAS), online tests (FAS)

### ASSESSMENT AND GRADING

<b>Ranges of points corresponding to grades</b>	<b>Final score (points) for all types of learning activities</b>	<b>ECTS grading scale</b>	<b>The national grading scale</b>	<b>Allocation of grade points</b>
	90-100	A	excellent	
	82-89	B	good	
	74-81	C		
	64-73	D	satisfactory	
	60-63	E		
	35-59	FX	Unsatisfactory (with the exam retake option)	
	0-34	F	Unsatisfactory (with mandatory repetition of the course)	

100% Final assessment as a result of Final exam (50%) and Continuous assessment (50%).  
50% Final exam: online tests  
50% Continuous assessment:  
• 30% practical assessment (including problem sheets, reporting on fieldwork, and case-studies);  
• 20% written individual task with oral presentation

<b>Course policy</b>	Students are expected to attend classes regularly, to get to class on time and stay for the duration of the class. In the case of absence, students will be required to submit all assignments to make up for the missed classes. Students are also expected to come to class having read all the required material and being ready to productively participate in the class discussions. Written assignments should be submitted before the specified deadlines.
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## COURSE STRUCTURE AND CONTENT

<b>Lecture 1</b>	Subject and tasks of ecology. Biosphere	<b>Workshop 1-2</b>	Economic levers of eco-friendly MSW management in Ukraine. World best practices and their adaptation	Self-study	The V.I. Vernadsky teaching on biosphere. Noosphere concept. Modern ideas about the noosphere development paradigm. Modern research on the global biosphere models creation (project "Biosphere -2")
<b>Lecture 2</b>	Environmental factors	<b>Workshop 3-4</b>	Identification of nitrates contain in food		Conference in Rio de Janeiro, 1992. Convention on Biological Diversity. Ukraine's commitments in the area of biodiversity conservation and examples of their implementation.
<b>Lecture 3</b>	Natural resources	<b>Workshop 5-7</b>	Environmental taxes paid calculation for the company's emissions to atmosphere from stationary sources of pollution		Ecological system. Energy in ecological systems. The concept of food chains. Natural and artificial selection. Typical sea river, forest, desert food chains. Anthropogenic factors of chains change
<b>Lecture 4</b>	Sustainable development	<b>Workshop 8-9</b>	Environmental taxes paid calculation for the company's pollutants discharges directly into water		Big and small elements cycle The carbon cycle Nitrogen cycle Phosphorus cycle Sulfur cycle
<b>Lecture 5-6</b>	Economic development and environmental factors	<b>Workshop 10-11</b>	Environmental taxes paid calculation for the company's waste disposal in specially designated areas		Ecological audit: essence, tasks, types. Environmental audit as a tool to increase enterprise's competitiveness and investment attractiveness.
<b>Lecture 7-8</b>	Environmental management	<b>Workshop 12-15</b>	Statistic methods in ecology		"Silent spring" and the impact of this book on understanding the environment problem in the mid-1970s.
		<b>Workshop 16</b>	Control work		

## RECOMMENDED READING

**Compulsory**

1. Lester R. Brown. (2011). *World on the Edge: How to Prevent Environmental and Economic Collapse*. NY: W. W. Norton Company.
2. Weisman, A. (2007). *The World Without Us*. NY: Thomas Dunne Books.
3. Clarke, G. (2013). *Elements of Ecology*. NY: The New Press.
4. Odum, E. (2004). *Fundamentals of Ecology*. NY: Cengage Learning.
5. Klein, N. (2014) *This Changes Everything: Capitalism vs. The Climate*. NY: Simon Schuster.
6. Tykhomyrova, T (Eds.). (2019). *Nitrate content in food*. Kharkiv: NTU "KhPI".

**Recommended**

7. Carson, R. (1962). *Silent Spring*. NY: Houghton Mifflin.
8. Flannery, T. (2006). *The Weather Makers*. NY: Grove Press / Atlantic Monthly Press
9. Cole, Matthew (2007) . *Economic growth and the environment, published in Handbook of Sustainable Development*, Edward Elgar Publishing Limited, Cheltenham
10. Justice Mensah (2019) *Sustainable development: Meaning, history, principles, pillars, and implications for human action: Literature review*, Cogent Social Sciences, 5:1, 1653531 - : <https://doi.org/10.1080/23311886.2019.1653531> Pedro Mateus Das Neves (2018), Literature Review On S
11. Lam, David (2005). *How the World Survived the Population Bomb: An Economic Perspective*, published in *The Economics of Sustainable Development*, W.E. Upjohn Institute for Employment Research, Michigan

**Academic integrity**

Graduate students are expected to adhere to the Code of Ethics of Academic Relations and Integrity” of NTU “KhPI”.

The content of this syllabus is consistent with the Ecology course program.