



SYLLABUS OF AN ACADEMIC DISCIPLINE Chemistry (organic, physical and colloid)

Academic degree - Bachelor's
Specialty 101 Ecology
Academic programme 101 Ecology

Year of study 1, semester 2
Form of study full-time
Number of ECTS credits 4
Language(s) of instruction English

Lecturer of the discipline

Lecturer's contact
information (e-mail)

URL of the e-learning
course on the NULES e-
learning portal

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<https://elearn.nubip.edu.ua/course/view.php?id=1213>

ACADEMIC DISCIPLINE DESCRIPTION

The aim of the discipline «Chemistry (organic, physical and colloid)» is to form students' theoretical foundations of organic, bioorganic, physical and colloid chemistry, practical skills in working with different types of organic compounds, studying the specific features of their behavior in chemical reactions, gaining experience in a chemical laboratory to solve specific practical problems, ability to work with scientific literature. The course of organic, bioorganic, physical and colloid chemistry should be the basis for the study of special disciplines: biochemistry, genetics, etc.

A student must be able to identify patterns of relationship between the structure and structure of chemical compounds; also be able to establish the relationship between the constituent parts of the substance, as well as individual components in mixtures; know the laws of chemical processes; to develop skills.

Competences of the discipline:

Integral competence (IC): The ability to solve complex specialized tasks and solve practical problems in the field of ecology, environmental protection and balanced nature management, which involves the application of basic theories and methods of environmental sciences, which are characterized by the complexity and uncertainty of conditions.

General competences (GC):

GC 8. Ability to conduct research at the appropriate level.

GC 11. Ability to evaluate and ensure the quality of the work performed.

Special (professional) competences (SC):

SC 2. Ability to critically understand basic theories, methods and principles of natural sciences.

Expected Learning Outcomes (ELO):

ELO 3. Understand the main concepts, theoretical and practical problems in the field of natural sciences, which are necessary for analysis and decision-making in the field of ecology, environmental protection and balanced nature management.

ELO 21. Be able to choose optimal methods and tools for research, data collection and processing.

ACADEMIC DISCIPLINE STRUCTURE

Topic	Hours (lectures/laboratory, practical, seminars)	Learning outcomes	Tasks	Assessment
1 semester				
Module 1				
Topic 1. Introduction. The most important theoretical principles of organic chemistry. Aliphatic hydrocarbons	2/4	Learn the basic concepts of the subject. Learn the rules of safety when working in a chemical laboratory.	Make a lab work. Do homework on this topic and send them to the elearn.	Up to 10 points for laboratory work and homework. Up to 5 additional points for other types of tasks (abstracts, presentations)
Topic 2. Hydroxyl organic substances: alcohols, phenols	2/4	To study the chemical properties. Master the method of determining them with the help of qualitative reactions	Make a lab work. Do homework on this topic and send them to the elearn.	Up to 10 points for laboratory work and homework. Up to 5 additional points for other types of tasks (abstracts, presentations)
Topic 3. Carbonyl and carboxyl compounds: aldehydes, ketones, carboxylic acids, fats	2/4	To study properties aldehydes, carboxylic acids, fats. Master the method of obtaining soap from fat. the	Make a lab work. Do homework on this topic and send them to the elearn.	Up to 15 points for laboratory work and homework. Up to 5 additional points for other types of tasks (abstracts, presentations)
Module 2				
Topic 4. Carbohydrates	2/4	To study the chemical properties of mono- and polysaccharides. Master the method of determining them with the help of qualitative reactions.	Make a lab work. Do homework on this topic and send them to the elearn.	Up to 10 points for laboratory work and homework. Up to 5 additional points for other types of tasks (abstracts, presentations)
Topic 5. Amines. Amino alcohols. Amino acids. Proteins. Heterocyclic compounds	2/4	To study the chemical properties of aromatic amines, amino acids and proteins. Master the method of determining them with the help of qualitative reactions.	Make a lab work. Do homework on this topic and send them to the elearn.	Up to 10 points for laboratory work and homework. Up to 5 additional points for other types of tasks (abstracts, presentations)
Module 3				
Topic 6. Fundamentals of	3/6	Know the subject and objectives of	Make a lab work. Do homework on	Up to 10 points for laboratory work

physicalchemistry		physical and colloid chemistry of chemistry, prospects for its development, the importance of practical activities of specialists; Know the basic concepts in physical chemistry, the laws of thermodynamics, Hess's law and its consequences.	this topic and send them to the elearn.	and homework. Up to 5 additional points for other types of tasks (abstracts, presentations)
Topic7. Fundamentals of Coloid Chemistry	2/4	Know the basic concepts of colloid chemistry, classification Understand and analyze adsorption processes. Be able to influence the passage of ion exchange processes. Be able to schematically write the structure of the micelles of lyophobicsol	Make a lab work. Do homework on this topic and send them to the elearn.	Up to 10 points for laboratory work and homework. Up to 5 additional points for other types of tasks (abstracts, presentations)
Total for 1st semester				70
Examination				30
Total for the course				100

ASSESSMENT POLICY

<i>Deadlines and exam retaking policy:</i>	Works that are submitted late without valid reasons will be assessed with a lower grade. Module tests may be retaken with the permission of the lecturer if there are valid reasons (e.g. a sick leave).
<i>Academic integrity policy:</i>	Cheating during tests and exams is prohibited (including using mobile devices). Term papers and essays must have correct references to the literature used
<i>Attendance policy:</i>	Attendance is compulsory. For good reasons (e.g. illness, international internship), training can take place individually (online by the faculty dean's consent)

SCALE FOR ASSESSING STUDENTS 'KNOWLEDGE AND SKILLS

Student's rating, points	National grading of exams and credits	
	exams	credits
90-100	excellent	pass
74-89	good	
60-73	satisfactorily	
0-59	unsatisfactorily	fail

RECOMMENDED SOURCES OF INFORMATION

1. Kovshun L.O., Boyko R.S., Khyzhan O.I., Krotenko V.V. Notebook for Laboratory Works in ORGANIC, BIOORGANIC, PHYSICAL AND COLLOID CHEMISTRY. Kyiv: NULES of Ukraine, 2019. 240 p.
2. Хижан О.І., Ковшун Л.О. Фізична і колоїдна хімія: навчальний посібник. К.: НУБіП України, 2022. 436 с.
3. Ковшун Л.О., Хижан О.І. Навчальний посібник. Фізична і колоїдна хімія. К.: НУБіП України, 2018. 501 с.
4. Хижан О.І., Ковшун Л.О. Навчальний посібник. Фізична і колоїдна хімія. К.: НУБіП України, 2019. 444 с.
5. Khyzhan O.I., Boyko R.S., Krotenko V.V. , Kovshun L.O. Notebook for laboratory works in physical and colloid chemistry. K.: DDP Expo-Druk, 2021, 155 p.
6. Khyzhan O.I., Kovshun L.O. Notebook for laboratory works in physical and colloid chemistry. K.: DDP Expo-Druk, 2020, 160 p.
7. Хижан О.І., Ковшун Л.О. Науково-методологічні основи лабораторного контролю безпеки сільськогосподарської продукції. Монографія. К.: НУБіП України, 2022. 448 с.
8. Tereshchenko N.Yu., Kovshun L.O., Khyzhan O.I., Nesterova K.A.. Methodology of laboratory control for the production of safe plant products. Monograph. Kyiv: NULES of Ukraine, 2021. 480 p.