Geology and Fundamentals of Geomorphology
Working program of the component (Syllabus)

Details of the component	
Level of higher education	**The first (educational and professional)**
Branch of knowledge	*10 Natural Sciences*
Speciality	*101 Ecology*
Educational program	*Environmental safety*
Status of component	*Required*
Form of training	*full-time/remote/mixed*
Year of preparation, semester	*2nd year, autumn semester*
Volume of component	*4 ECTS credits (120 hours))*
Semester control/ control measures	*Test*
Schedule of classes	
Language of instruction	*Ukrainian*
Information about course leader / teachers	*Lecturer: https://eco-paper.kpi.ua/pro-kafedru/vykladachi/shablij-tetyana-oleksandrivna.html* *Practical: https://eco-paper.kpi.ua/pro-kafedru/vykladachi/shablij-tetyana-oleksandrivna.html*
Course placement	*https://do.ipo.kpi.ua/course/view.php?id=2147*

Program of component

1. Description of the component, its purpose, subject of study and learning outcomes

1.1. The purpose of the component.

The purpose of studying this component is the formation of students' knowledge complex in the field of geology and geomorphology.

Geology refers to the natural sciences, its main sections are related to the methods of geological research, with initial information about the position of the Earth in a number of other planets of the Solar system, with the structure of the Earth, its age and the material composition of the earth's crust - minerals and rocks and their formation, with the main laws of geological exogenous and endogenous processes, the main structural elements of the Earth's crust and the laws of their development, modern tectonic concepts, economic importance of geology, geoecology, with the main stages of the development of the earth's crust and earth's surface, with the main historical and geological approaches to solving geological issues.

In accordance with the purpose of training bachelors requires the formation of the following competencies:

- Knowledge and understanding of theoretical fundamentals of ecology, environmental protection and balanced nature management;

- The ability to critically understand basic theories, methods and principles of natural sciences;

- The ability to justify the need and to develop measures aimed at preserving landscape and biological diversity and forming an ecological network.

1.2. The main tasks of the component.

In accordance with the requirements of the educational and professional program, students after mastering the credit module must demonstrate the following learning outcomes:

- To understand the basic environmental laws, rules and principles of environmental protection and nature management;

- To understand the basic concepts, theoretical and practical problems in the field of natural sciences that are necessary for analysis and decision-making in the field of ecology, environmental protection and optimal use of nature;

- To identify the factors that determine the formation of landscape and biological diversity;

- To choose the optimal strategy for holding public hearings on the problems and formation of the territories of the nature reserve fund and the ecological network;

- To raise the professional level by continuing education and self-education.

2. Prerequisitions and requisition of disciplines (place in the structural and logical scheme of training according to the relevant educational program)

Study of the component "Geology and Fundamentals of Geomorphology" is based on the principles of integration of various knowledge gained by students during the study of the following component "Chemistry and Fundamentals of Biogeochemistry". Component "Geology and Fundamentals of Geomorphology" provides the component "Landscape Ecology".

3. Contents of the component

Section 1. General questions

Topic 1. Structure and composition of the universe

Topic 2. General characteristics of planet Earth

Section 2. Earth's crust

Topic 3. Chemical and mineral composition of the earth's crust

Section 3. Look at the crystals.

Topic 4. Structure of crystals

Theme 5. Igneous rocks

Chapter 4: Exogenous Geological Processes

Topic 6. Physical and chemical weathering

Topic 7. Rivers

Topic 8. Glaciers

Topic 9. Groundwater

Topic 10. Oceans and seas

Topic 11. Lakes and swamps

Topic 12. Sediments and sedimentary rocks

Chapter 5: Endogenous Geological Processes

Topic 13. Magmatism

Topic 14. Metamorphism

Topic 15: Earthquake

Chapter 6: Geodynamic Processes

Topic 16. Geosynclinals and platforms

Topic 17. Fixism and mobileism

4. Training materials and resources

Basic

1. *Рудько, О.М. Адаменко, О.В. Чепіжко, М.Д. Крочак. Геологія з основами геоморфології: Підручник для студентів екологічних і географічних спеціальностей вищих навчальних закладів. Чернівці: Букрек, 2010. – 400 с.*
2. *Мислюк О. О. Геологія з основами геоморфології [Електронний ресурс] : навч. посіб. / О. О. Мислюк, О. М. Хоменко ; М-во освіти і науки України, Черкас. держ. технол. ун-т. – Черкаси : ЧДТУ, 2018. – 163 с. – режим доступу: http://elib.chdtu.edu.ua/e-books/2832*

Auxiliary (d)

1. *Рудько Г.І. Техногенна екологічна безпека геологічного середовища. – Львів: ВЦ ЛНУ ім. І. Франка, 2001. – 359 с.*
2. *Коржнев М.М., Вижва С.А., Ошляков О.Є., Гожик А.П., Корнєєнко С.В., Байсарович І.М., Аксьом О.С., Сухіна О.М. Екологічна геологія / За ред. д.г.-м.н. М.М. Коржнева – Київ: ВПЦ „Київський університет”. – 2005. – 257 с.*
3. *Мозговий В.В., Шабатура О.В., Онищенко А.М., Кузьминець М.П., Опрощенко І.О. Геологія з основами геоморфології і інженерної геології: навч. посіб. – К.: Леся, 2013. – 231 с.*
4. *П’яткова А.В., Муркалов О.Б. Практикум з геоморфології: навчально-методичний посібник. – Одеса: вид-во ОНУ імені І. І. Мечникова, 2017.–104 с.*
5. *Малахов І.М. Техногенез у геологічному середовищі. – Кривий Ріг: ОКТАНТ-ПРИНТ, 2003. – 252с.*
6. *Карпов В.Г. Геологія з основами геоморфології (Сучасні геодинамічні процеси): навчальний посібник – Х.: ХНУ імені В.Н. Каразіна, 2015. – 108 с.*

Information resources on the Internet

1. Ministry of Environmental Protection and Natural Resources of Ukraine - https://mepr.gov.ua/

2. Ecological portal of Ukraine – http://www.ecolog.org.ua/

3. Vernadsky Library – www.nbuv.gov.ua

4. Electronic archive of scientific and educational materials of KPI named after Igor Sikorsky - ELAKPI URL: https://ela.kpi.ua

Educational content

5. Method of mastering the component

Lecture classes

Lectures are aimed at:

- *providing modern, holistic, interdependent knowledge from the credit module "Geology and Fundamentals of Geomorphology", the level of which is determined by the target setting for each specific topic;*
- *ensuring in the process of lecturing the creative work of students together with the teacher;*
- *education of students of professional and business qualities and development of their independent creative thinking;*
- *formation of the necessary interest in students and providing direction for independent work;*

- *determination of the level of modern development of activities in the field of geology, its modern directions;*
- *reflection of methodical processing of the material (allocation of main thoughts and provisions, underlining conclusions, repeating them in different formulations);*
- *acquisition of visual, combination, if possible, with the demonstration of visual materials, layouts, models and samples;*
- *teaching in a clear and clear language, explaining all the newly introduced terms and concepts;*
- *accessibility for perception of this audience.*

Title of the lecture topic and list of main questions (list of didactic means, references to literature and tasks on the IWS)	*Number of hours*
Structure and composition of the universe. *Problems and methods of geology. Sciences of the geological cycle in higher education, their content and interrelationship. History of geological knowledge formation. Structure and composition of the universe. Stars and galaxies.* *Literature: [1] pp. 3-6, 7-9 .* *The task at the IWS is the stages of evolution of the solar system. [1] pp. 10-13*	*4*
General characteristics of planet Earth. *Earth in outer space. Origin of the Earth. Earth as a cosmic body: shape, size, mass, density. Geospheres of the Earth's structure. Geophysical fields.* *Literature: [1] p. 17-30.* *Tasks at the IWS – An idea of the composition of geospheres. [1] p. 24-27. Origin and practical use of the Earth's magnetic field. [1] p. 28-32.*	*4*
Chemical and mineral composition of the earth's crust. *Chemical composition of the earth's crust (elements of geochemistry). Clarks chemical elements. General information about minerals and the processes of their formation. Evolution of the chemical composition of the earth's crust. The law of permanence of angles in crystals. Minerals as natural compounds and geological bonds. Properties of crystalline substances.* *Literature: [1] p. 34-37.* *The task at the IWS is the texture-structural characteristics of mineral raw materials. [3] p. 106-120.*	*4*
Structure of crystals. *The shape of the crystals, the structure of their determination. Physicochemical types of structures. Phenomena of polymorphism and isomorphism. Optical, mechanical and chemical properties of minerals.* *Literature: [1] pp. 63-76, 80.* *The task on the IWS is elements of symmetry. Types of symmetry, category and syngony. [3] p. 67-68. Methods for determining the physical properties of minerals. [4] p. 139-224.*	*4*
Igneous rocks. *Petrographic composition of the Earth's crust. Methods and conditions of formation of rocks. Genetic groups of rocks, mineralogical and chemical composition of rocks. Phase composition of rocks. Igneous rocks are intrusive and effusive. Characteristics of igneous rocks.*	*2*

Literature: [1] p. 43-46. *Tasks at the IWS – Methods of phase analysis of rocks. [3] p. 129-139. Connection of deposits with the main structural elements of the earth's crust. [8] p. 31-35.*	
Physical and chemical weathering. *Exogenous processes. Weathering is physical and chemical. Formation of mineral deposits. Weathering products. Underwater weathering (inhibitorolysis).* *Literature: [1] p. 83-89.* *The task on the IWS is the concept of the genetic type of relief. [7] p. 14-15. Phases of development of cortex weathering. [3] p. 252-255.*	*4*
Activities of rivers. *Water surface runoff. Activity of the year. The emergence of scattered deposits.* *Literature: [1] p. 98-107.* *The task at the IWS is water chemistry and weathering modes. [3] p. 122-133. Periods and cycles of river erosion. [3] p. 84-90. Erosion forms of relief [7] p. 21-24.*	*2*
Activity of glaciers. *Glaciers, their prevalence and geological role. Conditions for the appearance of glaciers, ionosphere. Formation of fir and glacial ice. Types of glaciers, their activities. Morena and their origin. Conditions of glaciation in the history of the Earth.* *Literature: [1] p. 218-241.* *The task on the IWS is underground ice. [4] p. 238-243.*	*2*
Activities of underground water. *Groundwater, its prevalence. Physical composition of groundwater. Features of the chemical composition of groundwater. Classification of groundwater. Geological activity of groundwater. Change of rocks under the influence of groundwater.* *Literature: [1] p. 241-263.* *The task at the IWS is groundwater sediments. [3] pp. 127-129; [4] p. 236-240.*	*2*
Activity of oceans and seas. *Oceans and seas. Movement of ocean currents. Brief information about life in the ocean. Geological role of the oceans. The main minerals of the oceans.* *Literature: [1] p. 263-308.* *Tasks at the IWS are the main elements of the relief of the oceans. [3] pp. 160-163; [4] p. 215-218. Mining in the coastal zone. [8] p. 207-208.*	*2*
Activities of lakes and swamps. *Lakes and swamps. Types of lakes and swamps. Lake and marsh deposits. Fossil coal rocks.* *Literature: [1] p. 308-322.* *Tasks at the IWS – Areas of use of lake and marsh deposits [3] p. 308-322.*	*2*
Sediments and sedimentary rocks. *Sediments and sedimentary rocks, fossa and lithophation. Characteristics of sedimentary rocks. Earth's sedimentary shell. Time in geology. Methods of relative geochronology. Poleographic method. Fundamentals of absolute geochronology. Brief information about groups and systems (era, period) and the development of the organic world.* *Literature: [1] p. 337-349.* *The task at the IWS is the Structural Organization of Silicates, the most common mineral on Earth. [3] p. 72-81. Clay minerals, their composition, structure and*	*4*

conditions of formation. [3] p. 99-113. Dislocation of sedimentary rocks. [3] pp. 203-209; [3] p. 236-242. The ratio of the main geochronological and stratigraphic units. [3] pp. 32-35; [3] p. 75-77.	
Magmatism. *Magma, causes of its occurrence, composition and properties. Intrusive magmatism. Differentiation of magma, the appearance of deep intrusions. Phenomena that form processes at great depths: pneumotolite and hydrothermal. Effusive magmatism. Types of eruptions are central and cracked. Composition of benches. The nature of eruptions (types of volcanoes). Magmatism and the emergence of mineral deposits.* *Literature: [1] p. 131-156.* *The task at the IWS is the geographical prevalence of volcanoes. [3] p. 119-130. Ideas about the differentiation of magma. [3] p. 150-158.*	*4*
Metamorphism. *Metamorphism. The main causes and conditions of metamorphism. Mineral deposits that are associated with the processes of metamorphism. Tectonic processes. Types of tectonic movements of the Earth's crust. Disorders: treatative and dissuctional. Elements of the earth's rocks.* *Literature: [1] pp. 100-116, 156-168.* *Tasks on IWS – Properties of rocks depending on the conditions of metamorphism. [8] pp. 51-54, 78-82.*	*4*
Earthquake. *Earthquakes. Physical nature of earthquakes. Registration and study of earthquakes, their strength and energy. Moretrusses. Geographical spread of earthquakes and their forecast.* *Literature: [1] p. 121-131.* *The task on the IWS is the Earthquake Scale. [3] p. 340-345. Outstanding earthquakes. [3] p. 346-347.*	*4*
Geosynclinals and platforms. *Geosynclinals and platforms. Tectonic-magmatic activation of mainland platforms. Structural elements of oceanic crust.* *Literature: [1] p. 242-273.* *Tasks on IWS – Types of folding. [3] p. 327-330.*	*2*
Fixism and mobileism. *Tectonic cycles. The essence of modern geotectonic hypotheses. Hypotheses of fixism and mobileism.* ***Literature: [1] p. 364-371.*** *The task at the IWS is a comparative analysis of geotectonic hypotheses. [2] p. 57-59.*	*2*
Final lecture.	*2*
Total hours	*54*

Seminars

In the system of professional training of students, seminar classes occupy 25 % of the classroom load. Being an addition to the lecture course, they lay and form the basics of the Bachelor of Ecology qualification. The content of these classes and the methodology of their conduct should ensure the

development of creative activity of the individual. They develop scientific thinking and the ability to use special terminology, allow you to test knowledge, in connection with which this type of work acts as an important means of operational feedback. Therefore, seminars should perform not only cognitive and educational functions, but also contribute to the growth of students as creative workers in the field of ecology.

The main tasks of the series of seminars:

- help students systematize, consolidate and deepen knowledge of a theoretical nature in the cycle of environmental disciplines;

- teach students techniques for solving practical problems, promote mastering the skills and abilities of information analysis, come to their own informed conclusions;

- teach them to work with scientific and reference literature, documentation and schemes;

- to form the ability to learn independently, that is, to master the methods, methods and techniques of self-study, self-development and self-control.

The name of the topic of the lesson and the list of main questions (list of didactic support, references to literature and tasks on IWS)	*Number of hours*
The concept of minerals. Forms of finding minerals in nature. Physical properties of minerals. *Literature: [1] pp. 34-37; [2] pp. 50–76, 80.* *Tasks on the IWS. The concept of minerals and their main classes.*	*2*
Classification of minerals. Conditions of formation of minerals. Class of self-related minerals. *Literature: [1] pp. 34-37; [2] pp. 50–76, 80.* *Tasks on the IWS. Characteristics of ore-forming minerals. Characteristics of rock-forming minerals.*	*2*
Class of sulfides, sulfates, haloid compounds. *Literature: [1] p. 337-349.* *Tasks on the IWS. Sedimentary rocks, their origin and classification.*	*2*
Class of phosphates, carbonates, oxides and hydroxides. *Literature: [1] p. 337-349.* *Tasks on the IWS. Phases of the development of cortex weathering.*	*2*
Class of silicates and alumosilicats. *Literature: [1] p. 337-349; [2] pp. 72–81, 99–113.* *Tasks on the IWS. Clay minerals, their composition, structure and conditions of formation.*	*2*
Sedimentary rocks. *Literature: [1] pp. 203-209; [8] pp. 236-242.* *Tasks on the IWS. Minerals associated with sedimentary rocks. Dislocation of sedimentary rocks.*	*2*
Igneous rocks. *Literature: [1] pp. 131-156; [2] p. 150-158.* *Tasks on the IWS. Igneous rocks and their classification. Andntrusive and effusive rocks and their classification. The idea of the differentiation of magma.*	*2*
Metamorphic rocks.	*2*

Literature: [1] pp. 100-116, 156-18; [2] pp. 51-54, 78-82. *Tasks on the IWS. Metamorphic rocks and their classification. Types of metamorphism. Properties of rocks depending on the conditions of metamorphism.*	
Modular control test	*2*
Total hours	*18*

Independent work

Independent work of students takes 40 % of the time to study the component, includes writing an essay, preparing for MKR and scoring. The main task of independent work of students is the mastery of knowledge in the field of geological sciences, which are not included in the list of lecture questions, through personal search for information, the formation of an active interest in the creative approach in educational work and when writing an abstract.

No s/p	*Name of the topic submitted for self-study*	*Number of hours of IWS*
	Section 1. General questions	
1	*Stages of evolution of the solar system.* *Literature: [1] p. 100-101.* *Ideas about the composition of geospheres. The origin and practical use of the Earth's magnetic field.* *Literature: [3] pp. 244-247, 280-287.*	*5*
	Section 2. Earth's crust	
2	*Texture-structural characteristics of mineral raw materials.* ***Literature:*** *[3] p. 106-120.*	*5*
	Chapter 3: Types of Crystals	
3	*Elements of symmetry. Types of symmetry, category and syngony. Methods for determining the physical properties of minerals.* *Literature: [1] pp. 67-68; [3] p. 49-60.* *Methods of phase analysis of rocks. Connection of deposits with the main structural elements of the earth's crust.* *Literature: [1] pp. 129-139; [3] p. 31-35.* *The concept of minerals and their main classes.* *Literature: [4] pp. 34-37; [8] pp. 50–76, 80.* *Characteristics of ore-forming minerals. Characteristics of rock-forming minerals.* *Literature: [4] pp. 34-37; [8] pp. 50–76, 80.*	*5*
	Chapter 4: Exogenous Geological Processes	
4	*The concept of genetic type of relief. Phases of the development of cortex weathering.* *Literature: [2] p. 141-145.* *Water chemistry and weathering modes. Periods and cycles of river erosion. Erosional forms of relief.* *Literature: [2] pp. 122-133; [7] p. 84-90.* *Underground ice. Its genetic types.*	*5*

	Literature: [3] p. 238-243. *Sediments of groundwater.* *Literature: [8] pp. 127-129; [4] p. 236-240.* *The main elements of the relief of the oceans. Mining in the coastal zone.* *Literature: [2] p. 150-153; [7] p. 33-36.* *Areas of use of lake and marsh deposits.* *Literature: [8] p. 208-222.* *The structural organization of silicates is the most common mineral on Earth. Clay minerals, their composition, structure and conditions of formation. Dislocation of sedimentary rocks. The ratio of the main geochronological and stratigraphic units.* *Literature: [2] pp. 72-81; [7] p. 23-29.* *Sedimentary rocks, their origin and classification.* *Literature: [1] p. 337-349.* *Phases of the development of cortex weathering.* *Literature: [1] p. 337-349.* *Clay minerals, their composition, structure and conditions of formation.* *Literature: [1] p. 337-349; [3] pp. 72–81, 99–113.* *Minerals associated with sedimentary rocks. Dislocation of sedimentary rocks.* *Literature: [8] p. 203-209; [2] p. 36-42.*	
Chapter 5: Endogenous Geological Processes		
5	*Geographical prevalence of volcanoes. The idea of the differentiation of magma.* *Literature:[1] pp. 119-130, 150-158.* *Properties of rocks depending on the conditions of metamorphism.* *Literature: [1] pp. 51-54, 78-82.* *Scale of earthquakes. Outstanding earthquakes.* *Literature: [1] pp. 372-374; [3] p. 324-329.* *Igneous rocks and their classification. Andntrusive and effusive rocks and their classification. The idea of the differentiation of magma.* *Literature: [1] pp. 131-156; [3] p. 150-158.* *Metamorphic rocks and their classification. Types of metamorphism. Properties of rocks depending on the conditions of metamorphism.* *Literature: [1] pp. 100-116, 156-18; [3] pp. 51-54, 78-82.*	*5*
Chapter 6: Geodynamic Processes		
	Types of folding. *Literature: [2] p. 48-50.* *Comparative analysis of geotectonic hypotheses.* *Literature: [1] p. 384-387; [3] p. 274-281.*	*5*
4	*Abstract* *Literature: 5.*	*8*
5	*Preparation for the test*	*5*
6	*Preparation for MCT*	*5*
	Total hours	*48*

Individual tasks

According to the curriculum, the student must perform an individual task in the form of an abstract (analytical review).

Independent work performs several educational functions at the same time. Firstly, the abstract covers in a more specific form those issues that the teacher considered briefly; secondly, the student receives skills in working with scientific literature and the ability to analyze a certain problem; Thirdly, defending his scientific work in class in front of his colleagues, the author of the abstract learns to make scientific reports and defend his point of view in the discussion in which the students themselves participate.

The abstract should be based on the development of sources of basic and auxiliary literature. In addition, it is recommended to use as auxiliary literature monographs, special articles, textbooks for university students and periodicals.

The requirements for the implementation of the abstract are given in [5] literature.

Provision of program results by components of the component

Learning outcomes	*Lecture classes*	*Seminars, laboratory classes, individual tasks*
To understand the basic environmental laws, rules and principles of environmental protection and nature management	*Lecture. Physical and chemical weathering.*	*Seminar. Classification of minerals. Conditions of formation of minerals. Class of self-related minerals.* *Seminar. Class of sulfides, sulfates, haloid compounds.* *Seminar. Class of phosphates, carbonates, oxides and hydroxides.* *Seminar. Class of silicates and alumosilicats.*
To understand the basic concepts, theoretical and practical problems in the field of natural sciences that are necessary for analysis and decision-making in the field of ecology, environmental protection and optimal use of nature	*Lecture. Chemical and mineral composition of the earth's crust.* *Lecture. Structure of crystals.* *Lecture. Activities of rivers.* *Lecture. Activity of glaciers.* *Lecture. Activities of underground water.* *Lecture. Activity of oceans and seas.* *Lecture. Activities of lakes and swamps.* *Lecture. Magmatism.* *Lecture. Metamorphism.* *Lecture. Earthquake.* *Lecture. Geosynclinals and platforms.*	*Seminar. The concept of minerals. Forms of finding minerals in nature. Physical properties of minerals.* *Seminar. Classification of minerals. Conditions of formation of minerals. Class of self-related minerals.* *Seminar. Sedimentary rocks.* *Seminar. Metamorphic rocks.* *Seminar. Igneous rocks.*

	Lecture. Fixism and mobileism.	
To identify the factors that determine the formation of landscape and biological diversity	*Lecture. Physical and chemical weathering.*	*Seminar. The concept of minerals. Forms of finding minerals in nature. Physical properties of minerals.* *Seminar. Classification of minerals. Conditions of formation of minerals. Class of self-related minerals.* *Seminar. Sedimentary rocks.* *Seminar. Metamorphic rocks.* *Seminar. Igneous rocks.*
To choose the optimal strategy for holding public hearings on the problems and formation of the territories of the nature reserve fund and the ecological network		*Individual tasks (analytical review).*
To raise the professional level by continuing education and self-education.		*Individual tasks (analytical review).*

Politics and control

6. Policy of component

Rules for attending classes and behavior in classes

Students are obliged to take an active part in the educational process, not to be late for classes and not to miss them without a good reason, not to interfere with the teacher to conduct classes, not to be distracted by actions that are not related to the educational process.

Rules for assigning incentive and penalty points

encouraging points can be credited by the teacher only for the performance of creative works in the discipline or additional passage of online specialized courses with the receipt of the appropriate certificate:

https://www.coursary.com/course/introduction-to-geochemistry-FQT04f80?fromfld=lpads&reg=wst&refsrc=gg

https://www.coursary.com/course/geoscience-the-earth-and-its-resources-XZz053e6

https://www.coursary.com/course/introduction-to-geology-amp-gis-aZz0ac1

https://www.coursary.com/course/one-planet-one-ocean-IZz04c09

However, their amount cannot exceed 10 % of the rating scale..

Penalty points within the component are not provided.

Deadline and overlay policy

In case of debts from the credit module or any force majeure circumstances, students should contact the teacher through accessible (provided by the teacher) communication channels to solve problematic issues and coordinate the algorithm of actions for working out.

Academic Integrity Policy

Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the absence of references when using printed and electronic materials, quotes, opinions of other authors. Invalid hints and write-offs when writing tests, conducting classes; passing the credit for another student; copying of materials protected by the copyright system without the permission of the author of the work.

The policy and principles of academic integrity are defined in Section 3 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"https://kpi.ua/code.

Policy of academic behavior and ethics

Students should be tolerant, respect the opinion of others, object to formulate in the correct form, constructively maintain feedback in the classroom.

The norms of ethical behavior of students and employees are defined in Section 2 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute"https://kpi.ua/code.

7. Types of control and rating system for assessing learning outcomes (RCOs)

Distribution of educational time by types of classes and tasks from the component according to the working curriculum:

Semester	School time		Distribution of training hours			Control measures		
	Loans	acad. H.	Lecture	Seminar.	IWS	FCT	Abstract	Semester certification
3	4	120	54	18	48	1	1	Test

The student's rating from the component consists of points that he receives for:

1. four answers (each student on average per semester) at seminar classes

2. three control works (MCT is divided into 3 works lasting 30 minutes)

3. execution of the abstract

System of rating (weight) points and evaluation criterion

1. Work in seminars.

Weight point – 6. The maximum number of points at all seminars is: 6 points x 4 answers = 24 points

Criteria for assessing students' knowledge

Mark	Completeness of the answer
6	"excellent", full answer (at least 90 % of the necessary information)
5	"good", a sufficiently complete answer (at least 75% of the required information), or a complete answer with minor inaccuracies
2-4	"satisfactory", incomplete response (at least 60% of the required information) and minor errors

1	*Unsatisfactory response (does not meet the requirements for "satisfactory")*

2. Modular control.

Weight point – 20. The maximum number of points for all control works is equal to: 20 points x 3 robots = 60 points

The task of the control work consists of test questions (40 units) to the corresponding sections of the syllabus of the credit module.

Each question of the control work is estimated at 0.5 points.

3. Abstract.

Criteria for evaluating an individual student's task

Mark	*Completeness of the answer*
15…16	*"excellent» creative approach to solving the problem*
13...14	*"good", deep disclosure of the problem, reflected own position*
10...12	*"satisfactory", reasonable disclosure of the problem with certain shortcomings*
2…9	*"enough", compilative level abstract or topic disclosed incompletely*
0…1	*"unsatisfactory", the topic is not disclosed, the abstract is not counted*

Thus, the rating scale of the discipline is:

$$R=4*6+3*20+16=100 \text{ points}$$

According to the results of educational work before the first certification, the "ideal student" should score 40 points. At the first certification, the student receives "enrolled" if his current rating is not less than 20 points.

According to the results of educational work before the second certification, the "ideal student" should score 90 points. At the second certification, the student receives "enrolled" if his current rating is not less than 45 points.

The maximum amount of points is 100. To obtain a component score from the "automatic" module, you need to have a rating of at least 60 points.

Students who have a rating of less than 60 points at the end of the semester, as well as those who want to increase their grade in the ECTS system, perform scoring control work.

The starting score is points for the abstract.

The task of the control work consists of test questions (84 units) of different sections of the syllabus of the credit module.

Each question of the control work is estimated at 1 point.

The amount of points for scoring control work and abstract is transferred to the scoring assessment according to the table.

Points $R=r_{ref}+r_{with}$	*Score*
95...100	*Perfectly*
85...94	*Very good*

75...84	*Well*
65...74	*Satisfactory*
60...64	*Enough*
less than 60	*Disappointing*

8. Additional information from the component

Approximate list of abstract topics

1. Stages of evolution of the Solar system.
2. Earth in the world space and its emergence.
3. The internal structure of the Earth and methods of its research.
4. Questions about the nature of the Earth's core.
5. Ideas about the composition of geospheres.
6. Composition and structure of the earth's crust.
7. The earth's crust of continents and oceans.
8. Composition and structure of the Earth's mantle.
9. The main forms of relayeff earth's surface.
10. Reelarefowling factors.
11. Classification of relay formsisfu.
12. Origin and practical use of the Earth's magnetic field.
13. Methods for determining the physical properties of minerals.
14. The concept of minerals and their main classes.
15. Characteristics of ore-forming minerals.
16. Characteristics of rock-forming minerals.
17. The concept of rocks and their classification.
18. Sedimentary rocks, their origin and classification.
19. Osedonacopy in the ocean.
20. Minerals associated with sedimentary rocks.
21. Phases of the development of cortex weathering.
22. Water chemistry and weathering modes.
23. Geological activity of the wind.
24. Geological activity of glaciers.
25. The influence of the atmosphere on geological processes.
26. Periods and cycles of river erosion.
27. Oledination in the history of the Earth.
28. Groundwater sediments.
29. Origin of mineral waters.
30. The main elements of the relief of the oceans.
31. Mid-ocean ridges and reef zones.
32. Mining in the coastal zone.
33. Ocean floor resources.
34. Clay minerals, their composition, structure and conditions of formation.
35. Dislocation of sedimentary rocks.
36. Igneous rocks and their classification.
37. Metamorphic rocks and their classification.
38. Andntruzyvnyh and effusive rocks and their classification.
39. Ideas about the differentiation of magma.

40. Types of metamorphism.
41. Properties of rocks depending on the conditions of metamorphism.
42. Formation of ore deposits of minerals.
43. Geographical prevalence of volcanoes.
44. Geographical prevalence of earthquakes.
45. Features of the spread of earthquakes on the continents.
46. Scale of earthquakes.
47. Earthquake monitoring.
48. Tectonics of lithospheric plates – modern geological theory.
49. Types of folding.
50. Types of rupture violations.
51. Natural geological processes.
52. Tectonic movements: causes and classification.
53. Forms of geological bodies.
54. Platforms and shields.
55. Continental and oceanic plates, mechanisms of their movement.
56. Hypotheses of origin of oceans and continents.
57. The ratio of the main geochronological and stratigraphic units.
58. The concept of space-time treats in geology.
59. The concept of geological time.
60. Geochronology and stratigraphy.
61. The concept of control organisms.
62. Paleontological method and stratigraphic method.
63. Prequembrian stage of earth development.
64. Paleozoic stage of earth development.
65. Mesozoic stage of earth development.
66. Cenozoic stage of earth development.
67. Characteristics of the Pleistocene period.
68. Causes of extinction of organisms.
69. Catastrophic events and extinction of biota in the history of the Earth.

Work program of component (syllabus):
***Compiled** prof., Doctor of Technical Sciences, Shabliy T.O.*

***Approved** by the **Ecology and technology of plant polymers** (protocol № 17 from 29.05.2025)*
***Approved** by the CEF Methodical Commission (protocol №.11 of 27.06.2025)*

Appendix A

ABSTRACT REQUIREMENTS

1. Contents

The table of contents is placed directly after the title page. The table of contents includes: an introduction, sequentially listed names of all sections, subsections, points and subsections (if they have headings) of the body of the report, conclusions, a list of references, names of appendices and page numbers that contain the beginning of the material.

The table of contents is composed if the abstract contains at least two sections, or one section and an appendix, when the total number of pages is at least 10.

2. Introduction

In the introduction, the current state of the study of this issue (problem) is briefly assessed, noting practically solved problems, knowledge gaps in this area, leading scientists in this area, global trends in solving the tasks, and the purpose of the work.

The introduction begins on a new page. The recommended size of the introduction is 2-3 pages.

3. The main part

The main part of the abstract is a literature (patent) review. In the review of the literature on the subject of the essay, the theories and views, as well as the current state of the study of the issue on this subject, are presented as fully and systematically as possible based on published sources (literary data).

4. Conclusions

Conclusions are placed immediately after the presentation of the main material, starting from a new page. They contain an assessment of the received information.

5. List of references

The list of sources to which there are references in the abstract is given at the end of the text, starting from a new page. There should be references in appropriate places in the text.

Bibliographic descriptions in the list of references are presented in the order in which they are first mentioned in the text. Serial numbers of descriptions in the list are references in the text (reference numbers). Bibliographic descriptions of references in the list are provided in accordance with current requirements.

6. Appendices

Appendices contain material that: is necessary for the completeness of the report, but its inclusion in the main part of the report may change the orderly and logical view of the work; 2) cannot be placed in the main part due to the large volume or methods of reproduction.

Attachments may contain: - additional illustrations or tables; - additional list of sources; - printed slides (presentation) - as needed.

7. Registration requirements

The abstract must be completed by computer in accordance with the current regulatory and technical documentation for the execution of documents using printing and graphic computer output devices.

The work is drawn up on sheets of A4 format (210x297 mm), font size 14 points at 1.5 intervals with a calculation of no more than 40 lines per page. The dimensions of the field: top, bottom and left - 20 mm, right - 10 mm.

Separate words and formulas that fit into the printed text should be black and have a density close to the main text.

Proper names are given in the original language (at the first mention - mandatory). Structural elements: "CONTENTS", "INTRODUCTION", "CONCLUSIONS", "LIST OF REFERENCES" are not numbered, and their names are headings of structural elements.

Sections and subsections must have headings. Clauses and sub-clauses can have headings.

Headings of structural elements and sections must be placed in the middle of the line and printed in capital letters without a period at the end. Headings of subsections, clauses and subsections must begin with a paragraph. The space between the title and the following or previous text should be at least two lines. You cannot place a heading at the bottom of the page if only one line of text remains after it.

Chapters, subsections, clauses and subsections are numbered with Arabic numerals. The section number consists of the section number and the serial number of the section separated by a period, for example, 1.1, 1.2, etc. The item number consists of the section number, the subsection number (if any) and the serial number of the item, separated by periods, etc.

The pages of the work are numbered with Arabic numerals in the upper right corner, preserving the through numbering of the entire text. The title page is also included in the numbering, but the page number is not set.

Illustrations should be placed immediately after the text where they are first mentioned or on the next page. All illustrations (own and borrowed) must be referenced in the work. All illustrations that are brought to the presentation must be given in the main part of the work or in the appendices.

Drawings, drawings, graphs, schemes, diagrams must meet the requirements of regulatory and technical documentation. Illustrations are numbered with Arabic numerals within the chapter and are named "Figure", which together with the name of the illustration (if necessary) is placed under the figure, for example, "Figure 3.2 - Layout scheme" (second figure of the third chapter).

Numeric material is usually presented in the form of tables. A table should be placed immediately after the text in which it is mentioned for the first time or on the next page. All tables should be referenced in the text. Tables and figures are numbered. The word "Table" is placed to the left above the table.

Formulas and equations are given directly after the text in which they are mentioned, in the middle of a line with margins above and below at least one line. The formula or equation number consists of a section number and a serial number separated by a dot.

The number is placed in parentheses at the level of the formula at the end of the line. Explanations of symbols and numerical coefficients of formulas should be given directly below the formula, in the same order in which they are presented in the formula. The first line of the explanation begins with the paragraph with the word "de" without a colon.

Explanation of each symbol must start on a new line. References in the text to sources must be indicated by a serial number in the list of references, separated by two square brackets. Appendices should be placed in the order in which references to them appear in the text. Each application must start on a new page.

Appendices are marked in the middle of the line with capital letters (А, Б, В... ...). For example, "Appendix A". Then, symmetrically to the text, the title of the application is printed. Appendices must have the same page numbering as the rest of the work.

If necessary, the text of the appendix can be divided into sections, subsections and paragraphs (for example, D.4.1.3 - paragraph 4.1.3 of Appendix D). Illustrations, tables, formulas and equations must be numbered within each appendix (for example, figure D.3, table B.2, B.2 - the second formula of Appendix B, etc.).

The design of the abstract must meet the requirements for reports on the National Development and Reform Commission (DSTU 3008–95. State Standard of Ukraine. Documentation. Reports in the field of science and technology. Structure and rules of design).

8. Instructions on the procedure for abstract defense

In order to accustom the students to speaking in front of the audience based on the results of the work, it is planned to present the main information in the form of a presentation. The report presents the theories and views as fully and systematically as possible, as well as the current state of research on this topic. The time of the report should be 7-10 minutes.

After the main presentation, the student must answer questions from the audience, the opponent (a student appointed by the teacher before the presentation) and the teacher.

After passing all these defense components and providing materials to the teacher, the work is considered completed.