


TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV
INSTITUTE OF GEOLOGY

Department of Mineralogy, Geochemistry and Petrology

«APPROVED»
Deputy director on academic work

« 26 » 08 2022

WORK PROGRAMME OF DISCIPLINE
Advanced Mineralogy

for student

Branch of knowledge *10 Natural Sciences*
Training direction
(Speciality) *103 Earth Sciences*
Educational level *master*
Educational program *Geochemistry and Mineralogy*
Type of discipline *obligatory*

Teaching mode *full-time studies*
Academic year *2022-2023*
Semester *2*
Number of credits ECTS *4*
Language of teaching, learning
and evaluation *English*
Form of final control *modular test*

Lecturer: *Kvasnytsia Iryna (Ph.D, cand.sc.(geol), assistant professor of department of mineralogy, geochemistry and petrography)*

for 20__/20__ (_____) «__» 20__
for 20__/20__ (_____) «__» 20__
for 20__/20__ (_____) «__» 20__

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Kyiv - 2022

The aim of the discipline – is to provide an introduction to the main modern concepts required to understand minerals and their behaviour and to provide main knowledge about the spatial and temporal patterns of minerals forming and distribution in a particular geological formation.

Preliminary requirements:

1. knowledge of the theoretical foundations of mineralogy
2. be able to diagnose minerals by physical properties

Annotation of discipline:

The discipline provides major information on the content, structure, tasks current approaches and concepts of modern mineralogy; acquaints with major trends in modern mineralogy; a systematic review of minerals as a source of metals, energy and materials is provided.

The tasks of the discipline:

- to acquaint students with the basic concepts of modern mineralogy;
- to give an idea of modern concepts of properties of mineral matter;
- to give a systematic review of minerals as a source of metals, energy and materials;
- to introduce students to major trends in modern mineralogy.

The results of study:

<i>Results</i> (1. to know; 2. to be able)		<i>Methods of teaching and learning</i>	<i>Assessment methods</i>	<i>Percentage in the final assessment of the discipline</i>
1.1	content, structure, tasks, current approaches and concepts of modern mineralogy	<i>lecture, seminar</i>	<i>test, oral reports</i>	<i>up to 10%</i>
1.2	mineralogical zoning principles geological formations	<i>lecture</i>	<i>test</i>	<i>up to 10%</i>
1.3	features of mineral composition and specific constitutions, morphology, properties and genesis of minerals from mineralogical provinces of Ukraine	<i>lecture, seminar, self-studying work</i>	<i>test, oral reports</i>	<i>up to 15%</i>
2.1	identify patterns of distribution and formation of minerals in geological formations;	<i>lecture</i>	<i>test</i>	<i>up to 15%</i>
2.2	use and develop mineralogical methods and criteria for search and evaluation of mineral resources based on analysis results regional-mineralogical research	<i>lecture, self-studying work</i>	<i>test</i>	<i>up to 15%</i>
2.3	analyze geological article from modern periodical in English, followed by preparing a brief summary highlighting the main provisions of this article; prepare a presentation in English of the fundamental principles of mineralogy using modern computer technology and acquire the ability to present a presentation to audience.	<i>lecture, seminar, self-studying work</i>	<i>oral reports</i>	<i>up to 35%</i>

Correlation of discipline learning outcomes with program learning outcomes

Program Learning Outcomes	Discipline Learning Outcomes						
	1.1	1.2	1.3	2.1	2.2	2.3	
<i>To be able to apply knowledge and modern research methods of the Earth and its geospheres to identify and solve problematic issues in mineralogy, petrology and geochemistry.</i>		+	+	+	+	+	
<i>To apply scientific knowledge for the analysis of geochemical, petrological and mineralogical data, obtain concrete results and conclusions.</i>	+	+	+	+	+	+	
<i>To know the principles of mineralogical and geochemical zoning of geological formations, the features of their mineral and chemical composition, the specifics of the constitution, morphology, properties and genesis of minerals.</i>		+	+	+	+		

Structure of discipline: lectures, seminars, self-studying work of student

Scheme of grading forms:

Form of student evaluation:

- semester grading:

1. Control test 1: RS1.1- 1.3 (min - 6, max - 10 grades)

2. Control test 2: RS 2.1, 2.2 (min - 6, max - 10 grades)

3. 6 oral reports which can be presented in the form of presentations and abstracts: RS1.1, 1.3, 2.3 (min - 38, max - 60 grades in total)

- final assessment (modular test) in form of the written test (min - 12 , max - 20 grades)

The final assessment in the form of modular test is not obligatory, if the student refuses to participate in this form of assessment, the student will not receive the corresponding points for the final assessment. Final evaluation is in the form of a final test (total score of discipline (maximum 100 grades) is defined as the sum for the systematic work during the semester). Final evaluation based on the results of the student's work throughout the semester.

Procedure and evaluation system

	Semesters grades	Modular test	Final grade
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Min	48	12	60
Max	80	20	100

A student is not allowed to take the final grade in the form of credit if student has scored less than 40 points during the semester.

Organization of assessment: control is carried out on a module-rating system and includes: 6 oral reports which can be presented in the form of presentations and abstracts (where students should demonstrate the quality of the acquired knowledge and solve tasks) and 2 written module tests. The final assessment is made in the form of written modular test.

Assessment:

Conformity scale

Passed	60-100
Fail	0-59

**STRUCTURE OF THE DISCIPLINE
PLAN OF LECTURES AND SEMINARS**

#	Theme	Hours		
		Lectures	Seminars	Self-studying work
<i>Module 1</i>				
1	Theme 1. Introduction to the mineralogical sciences	2	-	2
2	Theme 2. The main concepts of crystallography and crystal morphology	4	-	8
3	Theme 3. Properties of mineral matter	6	2	10
4	Theme 4. Rock-forming minerals	4	-	10
5	<i>Control test 1</i>			2
<i>Module 2</i>				
6	Theme 5. Mineral resources and hazards. Minerals as a source of metals, energy and materials.	6	2	14
7	Theme 6. Mineral matter in space, mantle, ocean floor, biosphere, environmental management, jewelry	8	2	20
8	Theme 7. Major trends in modern mineralogy	2	-	10
9	<i>Control test 2</i>			2
	Total	32	6	78

Themes for self-studying work:

1. Basic concepts of crystallography
2. Mineral occurrences and environments
3. Industrial and gems minerals
4. Minerals as construction material
5. Manufacturing minerals
6. Physical properties of gems

Total hours of the discipline – 120, that include:

lectures – 32 hrs

seminars - 6 hrs

consultations - 2 hrs

self-studying work - 78 hrs

RECOMMENDED LITERATURE

Basic:

1. Advanced mineralogy / edited by Marfunin A.S.-Berlin. - Springer-Verlag. -1994. -550 p.
2. Dana's Manual of Mineralogy / revised by Hurlbut C.S.- New York.- John Wiley & Sons, Inc.-1944. - 480 p.
3. Deer W.A., Howie R.A., Zussmann J. Rock-forming minerals.-London.-The Geological Society.- 1997
4. Haldar S.K., Tisljar J. Introduction to mineralogy and petrology.- Elsevier.-2014.-338 p.
5. Minerals / edited by John P. Rafferty. - New York.- Britannica Educational Publishing. - 2012.- 338 p.
6. Montgomery, C.W. Environmental geology.- New York.- The McGraw-Hill Companies, Inc.- 2011.-532 p.
7. Putnis A. Introduction to mineral sciences .- New York.- Cambridge University Press .-1992. - 457 p.
8. Robb L.J. Introduction to ore-forming processes. - Blackwell Science Ltd. - 2005. - 373 p.
9. Strunz H., Nickel E.H. Strunz Mineralogical Tables.- Stuttgart.-2001
10. Szwacki N.G., Swacka T. Basic elements of crystallography.-Singapore.- Pan Stanford Publishing Pte. Ltd.- 2010. - 195 p.

Additional:

1. Довгий С.О., Павлишин В.І. Екологічна мінералогія України. К.: Наук.думка, 2003.
2. Matkovsky O.I., Pavlyshyn V.I., Slyvko Ye. M. Fundamentals of mineralogy of Ukraine. - Lviv.- Lviv university. -2008.
3. Yushkin N.P. Topomineralogy. - Nedra. - 1982. - 288p.