

TARAS SHEVCHENKO NATIONAL UNIVERSITY OF KYIV

INSTITUTE OF GEOLOGY

Department: **Geoinformatics**

«APPROVED»

Deputy Director on academic work


« 31 » 08 2021

WORK PROGRAMME OF THE DISCIPLINE INTERNATIONAL PRACTICE OF SUBSOIL AND NATURAL RESOURCE ASSESSMENT

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for student

Branch of knowledge 19 Architecture and Construction
Training direction (Specialty) 193 Geodesy and Land management
Educational level master
Educational programs Evaluation of land and real estate
Type of discipline Obligatory

Teaching mode full-time studies
Academic year 2021/2022
Semester 1
Number of credits ECTS 7
Language of teaching, learning and evaluation English, Ukrainian
Form of final control exam

Lecturers: *Kurylo Mariia, DSc in Geology, Associate professor, Department of Geology of Mineral Deposits.*

To be continued

for 2022/2023  « 31 » 08 2021

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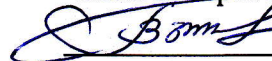
Kyiv - 2021

Author(s): Kurylo Mariia, DSc in Geology, Associate professor, Department of Geology of Mineral Deposits

APPROVED

17 05 2021


Head of department of Geoinformatics

 (Vitalii Zatserkovnyi)

Protocol №11 dated 17/05/2021

Approved by Scientific-methodical Commission of Institute of Geology

Protocol №_1_ dated _31/_08_/ 2021

Head of the scientific methodical commission  (Demidov V.K.)

The aim of the discipline - to introduce students with general principles and methods of quantitative, qualitative and monetary assessment of minerals and natural resources. It will be introduced domestic and international standards as well resources evaluation as mineral and natural property valuation.

Preliminary requirements:

1. Basic knowledge of general disciplines of Earth sciences to be able to define main directions of use of natural resources
2. Basic knowledge of economic geology, mathematical statistics, economic theory.
3. The level of English proficiency at least B1.

Annotation of discipline:

Academic discipline « International practice of subsoil and natural resource assessment » is part of education and sciences training program for the education level "master" of specialty 193-Geodesy Land surveying, educational program: Valuation of land and property.

This discipline is obligatory discipline for educational program "Valuation of land and property".

This discipline is obligatory discipline for educational program «Evolution of land and real estate».

The discipline is taught in the 1st semester of 1 year Master’s degree program in volume – 210 hours (7 credits ECTS) including lectures – 28 hours, practical trainings – 28, consultations – 8 hours, self-study work – 144 hours. The course content provides two modules and modular tests.

The discipline is finished by exam.

The tasks of the discipline – to highlight the following issues:

- studying of modern approaches and methods at estimations and valuation of natural resources and mineral deposits;
- study of the life cycle of the development of natural resources depending on their types;
- mastering methods of geological and mining modeling mineral deposits;
- their valuation based on principles of sustainable development.

The results of study:

	<i>Learning results (1. to know; 2. be able to; 3. communication; 4. autonomy and responsibility)</i>	<i>Methods of teaching and learning</i>	<i>Assessment methods</i>	<i>Percentage in the final assessment of the discipline</i>
1.1	<i>Basic concept in natural resources assessment, terms and definitions. Classifications of natural resources.</i>	<i>Lecture</i>	<i>Paperwork</i>	<i>up to 5%</i>
1.2	<i>Main differences in domestic and international assessment systems</i>	<i>Lecture</i>	<i>Paperwork</i>	<i>up to 5%</i>
1.3	<i>Types of assessment and valuation of natural resources</i>	<i>Lecture, practical works</i>	<i>Paperwork</i>	<i>up to 10%</i>
1.4	<i>Principles of international assessments and valuation of natural resources</i>	<i>Lecture, practical works</i>	<i>Paperwork</i>	<i>up to 10%</i>
1.5	<i>International organizations for natural</i>	<i>Lecture practical</i>	<i>Paperwork</i>	<i>up to 10%</i>

<i>Learning results (1. to know; 2. be able to; 3. communication; 4. autonomy and responsibility)</i>		<i>Methods of teaching and learning</i>	<i>Assessment methods</i>	<i>Percentage in the final assessment of the discipline</i>
	<i>resource management</i>	<i>works</i>		
1.6	<i>Main principles and tools of United Nations Resource Management System, United Nations Framework Classification for Resources, CRIRSCO (Committee for Mineral Reserves International Reporting Standards) and others</i>	<i>Lecture, practical works</i>	<i>Paperwork</i>	<i>up to 10%</i>
2.1	<i>Determine effective and sustainable directions for the use of natural resources, both individual resources and a complex of natural resources</i>	<i>Lecture, practical works</i>	<i>Paperwork</i>	<i>up to 15%</i>
2.2	<i>Calculating the optimal use lifetime for natural resources and mineral reserves</i>	<i>lecture</i>	<i>Paperwork</i>	<i>up to 10%</i>
2.3	<i>Cost-benefit analyze and Cash flow calculation for natural resources projects</i>	<i>lecture</i>	<i>Paperwork</i>	<i>up to 5%</i>
3.1	<i>Formation of written reports on valuation of natural resources projects</i>	<i>practical works</i>	<i>Paperwork</i>	<i>up to 15%</i>
4.1	<i>Proving correctness of selected methods for quantitative and cost estimation for natural resources projects</i>	<i>practical works</i>	<i>Paperwork</i>	<i>up to 5%</i>

Relationship between the discipline's and Programme's study results

	Discipline study results											
	1.1	1.2	1.3	1.4	1.5	1.6	2.1	2.2	2.3	3.1	4.1	
Programme study results												
PSR 11. To have the methods of land management design, territorial and economic land management, land use planning and protection, taking into account the influence of a number of socio-economic, ecological, landscape, nature protection and other factors.	+			+								+

Structure of discipline: lectures, practical works, self-studying work of student

Scheme of grading forms:

Form of student evaluation

Semester grading:

1) Control test (min – 6, max – 10)

2) Control test (min – 6, max – 10)

3) Works paper and oral reports (min – 24, max – 40)

2. Final assessment is in the form of an exam (min – 24, max – 40) (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 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
<i>Min</i>	36	24	60
Max	60	40	100

For students who have obtained total grades less than critically-calculated minimum of 20 grades repeated control test is obligatory for taking the test. The modular test cannot be less than 12 grades in order to obtain a general positive assessment for the course.

Grading: For admission to the final grading it is obligatory: 1) to pass two control tests; 2) to prepare six oral reports, which can be presented in the form of presentations and abstracts. The final grading is carried out in the form of written modular test.

**Assessment:
Conformity scale**

Excellent	90-100
Good	75-89
Satisfactory	60-74
Fail	0-59

STRUCTURE OF THE DISCIPLINE

PLAN OF LECTURES AND SEMINARS

№ п/п	Theme	Total hours		
		Lectures	Practical classes	Self-studying work
Module 1. International practice of natural resources' assessment				
1	Theme 1. Basic concepts of natural resources' assessment. Main subjects and methods	2	2	10
2	Theme 2. Global trends in the assessment of natural resources	2	2	15
3	Theme 3. Depletion of natural resources and material intensity in their assessment	2	2	15
	Theme 4. United Nations Resource Management System	2	2	10
	Theme 5. United Nations Framework Classification for Resources	4	4	10
	<i>Test 1</i>			2
Module 2. International practice of subsoil resources' and minerals assessment				
4	Theme 6. Main principles and instruments of minerals assessment with CRIRSCO Standards (The Committee for Mineral Reserves International Reporting Standards)	4	4	26
5	Theme 7. Main principles and instruments of minerals assessment with SPE-PRMS standarts (Society of Petroleum Engineers (SPE) Oil and Gas Reserves Committee, Petroleum Resource Management System (PRMS))	4	4	14
6	Theme 8. Mineral Property Valuation: Principles and Procedures	4	4	20

Theme 9. Comparison of domestic and international assessment standards	4	4	20
Test 2			2
Total	28	28	144

Total hours of the discipline – 210, that include:

- lectures – **28 hrs**
- practical classes - **28 hrs**
- consultations - **10 hrs**
- self-studying work - **144 hrs**

RECOMMENDED LITERATURE

Basic:

1. Application of environmental accounting on subsoil asset. The Case study for the Czech Republic. Milan Scasny* Charles University Environment Center, Czech Republic//http://mdgs.un.org/unsd/envaccounting/ceea/archive/Energy/Czech_SubsoilAssets.PDF
2. CRIRSCO Standards (The Committee for Mineral Reserves International Reporting Standards)// <https://www.criusco.com/>
3. Petroleum Resources Management System (PRMS) <https://www.spe.org/en/industry/petroleum-resources-management-system-2018/>
4. Mario E. Rossi • Clayton V. Deutsch. Mineral Resource Estimation.- Springer Science+Business Media Dordrecht, 2014.
5. Mineral Property Valuation: Principles and Procedures// <https://mrmr.cim.org/en/standards/valuation-guidelines-for-mineral-properties>
6. Mineral valuation: A selected literature review// [https://doi.org/10.1016/S0167-9031\(87\)90980-7](https://doi.org/10.1016/S0167-9031(87)90980-7)
7. United Nations Framework Classification for Resources//https://unece.org/DAM/energy/se/pdfs/UNFC/publ/UNFC_ES61_Update_2019.pdf
8. United Nations Resource Management System// <https://unece.org/sustainable-energy/publications/united-nations-resource-management-system-overview-concepts>
9. Keith Abergel. Mineral Asset Valuation Codes: Towards an International Standard // https://qspace.library.queensu.ca/bitstream/handle/1974/12364/Abergel_Keith_201408_MASc.pdf;sequence=1
10. Wellmer E.W. Economic evaluation in exploration. – Springer Verlag, Berlin, 2008.

Additional:

1. NSF Expeditions in Computing, “Understanding Climate Change: A data-driven Approach,” <http://climatechange.cs.umn.edu/>, 2017.
2. American Geophysical Union, “Earth & Space Sciences Informatics,” <http://essi.agu.org/>, 2017.
3. NSF-funded Research Collaboration Network, “Intelligent Systems for Geosciences,” <https://is-geo.org/>, 2017.
4. U.S. Geological Survey, “Land Processes Distributed Active Archive Center,” <https://lpdaac.usgs.gov/>, 2017
5. National Oceanic and Atmospheric Administration, “National Centers for Environmental Information,” <https://www.ncdc.noaa.gov/>, 2017
6. <https://www.atlasnatuurlijkkapitaal.nl/en/natural-capital>
7. <https://www.usgs.gov/>
8. <https://www.ga.gov.au/>

9. <https://www.nrcan.gc.ca/science-and-data/research-centres-and-labs/geological-survey-canada/17100>
10. <https://mepr.gov.ua/>
11. <https://www.geo.gov.ua/>
12. <https://map.land.gov.ua/>
13. <https://www.resourcepanel.org/reports/building-biodiversity>
14. <https://www.responsiblerawmaterials.com/useful-links>
15. <http://tool.globalcalculator.org/>
16. <https://intraw.eu/world-barometer/>