

**Taras Shevchenko National University of Kyiv  
Institute of Geology**

Department: **General and Historical Geology**

**«APPROVED»**  
Deputy director on academic work

*R. M. D.*  
«14» 12 2023

WORK PROGRAMME OF THE DISCIPLINE

**MICROPALEONTOLOGY**

*For students*

Branch of knowledge: **10 – Natural sciences**  
Training direction (Speciality): **103 – Earth sciences**  
Educational level: **Master**  
Educational program: **Geology**  
Type of discipline: **Optional**

Teaching mode	full-time studies
Academic year	2023/2024
Semester	2
Number of credits ECTS	5
Language of teaching, learning and evaluation	English
Form of final control	test

Lecturers: **Angelina Menasova, docent**, candidate of Geological Sciences, at the Institute of Geology of the National Academy of Sciences of Ukraine.

Prolonged: 20\_\_/20\_\_ (\_\_\_\_) «\_\_» 20\_\_  
20\_\_/20\_\_ (\_\_\_\_) «\_\_» 20\_\_

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«Approved»

Head of the Department of General and Historical Geology

 (Dmitro KRAVCHENKO)

Record of the Department meeting

# 7, «5» травня 2023

Approved by Scientific-Methodical Commission of the Institute of Geology

Record of the meeting # 3, «27» ліпня 2023

Head of Scientific-Methodical Commission \_\_\_\_\_ (Vsevolod DEMYDOV)

**Aim of the discipline** is to familiarize students with the achievements of modern paleontology, the special role of micropaleontology in the latest stratigraphic studies, the possibilities of different groups of micropaleontological remnants and the importance of microfossils for the construction of zonal biostratigraphic scales of different rank, solving the problems of paleogeography and knowledge of the general patterns of evolution of the organic world.

**Discipline requirements:** knowledge of the discipline "Evolution of the Earth".

**Annotation of teaching discipline:**

Students are introduced to general information about micropaleontology as a science; the history of formation, its components are covered; general understanding of the main groups of microorganisms. The methods of processing of samples for extraction of calcareous, siliceous and organic-walled microfossils are also considered; students master the method of micropaleontological research, study the morphology, systematics, evolution and lifestyle of a number of groups of fossil organisms.

**Object (teaching purposes):**

- to acquaint students with the theoretical foundations of micropaleontology;
- to acquaint students with the methods of laboratory processing of different groups of microfossils;
- acquisition of necessary methodological knowledge and practical skills by students to identify representatives of different groups of microfossils;
- mastering students basic knowledge about the main theoretical and practical achievements of modern micropaleontology.

**Learning results:**

Learning results (1. to know; 2. be able to; 3. communication; 4. autonomy and responsibility)		Form/Methods of teaching and studying		Form / Methods of evaluation	Percentage in the final assessment of the discipline
Code	Learning results				
1.1	The main tasks of micropaleontology	lecture, work	laboratory	Paperwork	up to 10%
1.2	Principles of a systematic approach to the study of microfossils	lecture, work	laboratory	Paperwork	up to 10%
1.3	Work with equipment for micropaleontological research	lecture, work	laboratory	laboratory work	up to 15%
2.1	Apply laboratory methods of processing of samples for different types of fossil remains	lecture, work	laboratory	laboratory work	up to 15%
2.2	Identify and describe representatives of different groups of microfossils	lecture, work	laboratory	laboratory work	up to 10%
2.3	Be able to validate your knowledge personally.	self-study		the Exam	up to 10%
3.1	Ability to cooperative work for effective solving of the task	self-study		the Exam	up to 10%
4.1	Understanding personal	self-study		the Exam	up to 10%

	responsibility for personal decisions			
4.2.	Ability to work in an international context and in a global information environment by occupation	self-study	the Exam	up to 10%

**Structure of the discipline:** lectures, laboratory work, self-studying work of students

**Learning Outcomes vs scheduled results of tuition:**

<i>Learning Outcomes</i>	1.1	1.2	1.3	2.1	2.2	2.3	3.1	4.1	4.2.
	<b>Program results of the tuition</b>								
<b>PO 2.</b> Apply your knowledge to determine and solve problematic issues and making informed decisions in issues paleontology, stratigraphy, geotectonics, modeling geological processes and structures, geology of mineral deposits minerals and their geological and economic assessment.	*	*	*	*	*	*			
<b>PO 7.</b> Know modern methods of geological research environment and be able to apply them in industrial and scientific research activities.	*	*	*	*	*	*	*	*	*
<b>PO 10.</b> Demonstrate the ability to adapt and act in a new situations related to professional work, the ability to generate new ones ideas in the field of stratigraphy, paleontology, geotectonics, modeling of geological systems, prospecting and exploration of deposits of minerals, economic geology.			*	*	*	*			*

**Scheme of grading forms:**

**Semester grading:**

- 1) Complex control work on microfossil groups - 40 points (cross-border score is 24 points)
- 2) Grading for work at laboratory work - 40 points (passing grade is 24 points)
2. Test in the form of the written test: maximum grade is 20 points, passing grade is 12 points.

Results of educational activity of students grading are based on 100 grading scale.

**The final grade is based on the results as the sum for the module grades, practical classes grades and the results of the zalik.**

Total	Semester grade	test	Final grade
Minimum	48	12	60
Maximum	80	20	100

*A student is not allowed to pass a Exam if he graded less than 20 points during semester.*

**Grading:** Control is carried out according to the modular rating system and provides for: passing of 8 laboratory work (where students must demonstrate the quality of the acquired knowledge and solve the tasks set using the methods outlined by the teacher); passing of individual work (where students should demonstrate the quality of the acquired knowledge) and to solve the tasks without limiting the tools and techniques of solving the problem) and passed 2 written tests. The final grading is carried out in the form of a written Exam.

**Matching Scale**

Passed	60-100
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Fail	0-59
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### PLAN OF LECTURES AND LABORATORY WORK

№	Theme	Total hours		
		Lectures	laboratory work	Self-studying work
<b>Module 1. Micropaleontology. Fundaments</b>				
1	<b>Theme 1.</b> Micropaleontology. Concept, history and present state of the concept: Aims, programming and evaluation. Concept. History of Micropaleontology. Interest and relation with other disciplines. Applied Micropaleontology.	2		7
2	<b>Theme 2.</b> Methodology. Samplings, laboratory techniques and research methods: Methodology of sampling and collecting materials. Laboratory preparation techniques. Observational methods, study and classification. Methods based on informatics software.	2	2	7
	<b>Module 1</b>		1	
3	<b>Theme 3.</b> Foraminifers: Biology, organization of the shell and classification: General characteristics. Biology of foraminifera. Organization of the shell. Classification. Origin and evolution.	2	2	7
4	<b>Theme 4.</b> Planktic Foraminifera. Globigerinina: Biology. Systematic. Evolution and extinction. Biostratigraphy. Ecology and paleoecology. Taphonomy and fossilization.	2		7
5	<b>Theme 5.</b> Benthic Foraminifera. Lagenina Involutinina, Robertinina, General characteristics and classification. Suborders Lagenina, Involutinina, Robertinina, Spirillinina, Carterinina and Silicoloculinina.	2	2	7
6	<b>Theme 6.</b> Benthic Foraminifera. Rotaliina: General characteristics and classification. Microforaminifera (serial and spiral forms). Larger Foraminifera (orbitoidids, orthofragminids, lepidocyclinids, nummulitids, etc.). Evolution and extinction. Biostratigraphy. Paleoecology.	2		7
7	<b>Theme 7.</b> Benthic Foraminifera. Miliolina: General characteristics and classification. Microforaminifera (cornuspiroids and milioloids). Larger foraminifera (soritoids and alveolinoids). Evolution and extinction. Biostratigraphy. Paleoecology.	2	2	7
8	<b>Theme 8.</b> Benthic Foraminifera. Fusulinina: General characteristics and classification. Parathuraminoids, endothiroids and fusulinoids. Evolution and extinction. Biostratigraphy. Paleoecology.	2		7

9	<b>Theme 9.</b> Benthic Foraminifera. Allogromiina and Textulariina: General characteristics and classification. Suborder Allogromiina. Suborder Textulariina. Orbitolinoids. Evolution and extinction. Biostratigraphy. Paleocology.	2	2	7
10	<b>Theme 10.</b> Radiolaria: General characteristics. Biology, morphology and classification. Evolution. Ecology and paleoecology. Biostratigraphy. The radiolaritics genesis.	2		7
11	<b>Theme 11.</b> Tintinids: History of their study. Biology of recent tintinids. The lorica of fossil tintinids. Sample preparations. Fossil record of tintinids. Calpionellids and related microfossils. Paleobiogeography. Biostratigraphy.	2	2	7
12	<b>Theme 12.</b> Bacteria: Biology. Classification. Metabolism. Ecology. Cianobacteria: their relevance as stromatolith builders. Other examples of bacterial sedimentogenesis.	2		7
13	<b>Theme 13.</b> Coccolitoforids and other calcareous nannofossils: General characteristics. Biology. Morphology of coccolits. Classification. Evolution. Ecology and paleoecology. Biostratigraphy.	2	2	8
14	<b>Theme 14.</b> Diatoms and silicoflagelates: Groups of siliceous nannoplankton. General characteristics and classification. Diatoms (Bacillariophyta). Silicoflagellates (Silicoflagellata).	2	2	8
	<b>Module2</b>		1	
	<b>Test</b>	2		
	<b>Total</b>	<b>30</b>	<b>18</b>	<b>100</b>

**Total - 150 hours:**

*Lectures -30 hours,*

*laboratory work - 18 hours*

*Consultations - 2 hours*

*Self-work - 100 hours*

## References:

### **Basic:**

1. CITA, M.B. 1964. *Micropaleontologia*. Ed. La Goliardica. Milán. 458 p.
2. DE RIVERO, F.C., BERMÚDEZ, P.J. 1963. *Micropaleontología general*. Ed. Gea. 807 p.
3. BRASIER, M.D. 1980. *Microfossils* Ed. G. Allen y Unwin. 193 p.
4. JENKINS, D.G. ed. 1993. *Applied Micropaleontology*. Ed. Kluwer Academic. 269 p.
5. ARMSTRONG, H.A., BRASIER M.D. 2005. *Microfossils*. Blackwell Publishing. 296 p.
6. KATHAL, P.K. 2012. *Applied Geological Micropaleontology*. Scient. Publis., India. 229 p.
7. PRATUL KUMAR SARASWATI, SRINIVASAN M.S. 2015. *Micropaleontology: Principles and Applications. Hardcover*. 234 p.
8. KATHAL ABU, NIGAM P. K., TALIB R. 2017. *Micropaleontology and its Applications. Unknown Binding*. 342 p.

### **Additional:**

9. ARMSTRONG, H.A., BRASIER, M.D. 2005. *Microfossils. Blackwell Publishing*. Second Edition. 296 p.
10. HAQ B.U., BOERSMA A. 1998. *Introduction to marine Micropaleontology. Elsevier Science (Singapore)*. 385 p.
11. Shevchuk O., Dorotyak Yu. 2019. Features of micropaleontological characteristics of the upper jurassic deposits and paleogeography of the territory of Kamyanska sections (northwest Donbas). *Paleontological review*. Lviv. № 51. P. 14-24.
12. Shevchuk O.A., Veklych O.D., Dorotyak Yu.B. 2015. Microforaminifers of the Callovian and Cretaceous sediments of Ukraine. *Geological Journal*. Kyiv, No. 2. P. 57-70.