Міністерство освіти і науки України
Харківський національний університет імені В.Н. Каразіна
Кафедра фізичної географії та картографії

"ЗАТВЕРДЖУЮ"
В.о. декана факультету
геології, географії, рекреації і
туризму
(вказати назву структурного підрозділу)
Катерина КРАВЧЕНКО
(вказати П.І.Б керівника)
серпня 2025 р.

РОБОЧА ПРОГРАМА НАВЧАЛЬНОЇ ДИСЦИПЛІНИ

CARTOGRAPHIC BASE FOR SPATIAL PLANNING

(назва навчальної дисципліни)

рівень вищої освіти	**другий (магістерський)**
галузь знань	**Е. Природничі науки, математика та статистика** (шифр і назва)
Спеціальність	**Е4. Науки про Землю** (шифр і назва)
освітня програма	**Картографія, геоінформаційні системи і дистанційне зондування Землі** (шифр і назва)
спеціалізація	(шифр і назва)
вид дисципліни	**обов'язкова** (обов'язкова / за вибором)
Факультет	**геології, географії, рекреації і туризму**

2025/ 2026 навчальний рік

Програму рекомендовано до затвердження Вченою радою факультету геології, географії, рекреації і туризму
"27" серпня 2025 року, протокол № 12

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Протокол від "26" серпня 2025 року № 15

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(підпис) (прізвище та ініціали)

Програму погоджено з гарантами освітньо-професійних програм:

Гарант ОПП «Картографія, геоінформаційні системи і дистанційне зондування Землі»

_____ **Анатолій БАЙНАЗАРОВ**
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Програму погоджено науково-методичною комісією факультету геології, географії, рекреації і туризму
Протокол від "27" серпня 2025 року № 7

Голова науково-методичної комісії
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_____ **Юлія ПРАСУЛ**
(підпис) (прізвище та ініціали)

INTRODUCTION

The curriculum of the discipline **"Cartographic base for spatial planning"** is compiled in accordance with the educational and professional training program of the **master's degree:**

Cartography, Geographic Information Systems and Remote Sensing of the Earth

specialty E4. Earth Sciences.

1. Description of the discipline

1.1. The subject of study of the discipline is the principles, techniques, and tools used in cartography to provide a foundational understanding of mapping and spatial data analysis for effective spatial planning.

1.2. The purpose of teaching of the discipline is providing students with theoretical knowledge and practical skills in cartographic substantiation of spatial planning in connection with natural, social, economic, environmental, political and aesthetic aspects of spatial development.

1.3. The main tasks of teaching the discipline are providing students with: the concepts of spatial planning and modern planning systems of the world countries (including Ukraine); the knowledge of properties and features of cartographic works that serve to substantiate the spatial planning; skills of working with the cartographic works and their design; the knowledge, techniques and methods of analysis, evaluation and use of cartographic information in spatial planning, including the use of geographic information systems.

1.4. The number of credits: 5.

1.5. Total hours: 150.

1.5. Characteristics of the discipline	
Normative discipline	
Full-time education	Distance education
Preparation year	
1st	1st
Semester	
1st	1st
Lectures	
32 hours	8 hours
Practical, seminar classes	
32 hours	6 hours
Laboratory classes	
hours	hours
Individual work	
86 hours	136 hours
Individual tasks	
hours	hours

1.6. The list of competencies that this discipline forms:

GC 03. Ability to communicate with representatives of other professional groups at different levels (with experts from other fields of knowledge/types of economic activity).

GC 04. Ability to work in an international context.

SC 01. Understanding the necessity of complying with copyright and related intellectual property rights; awareness of the national and international systems of legal protection of intellectual property.

SC 02. Knowledge of modern principles of nature management, interaction between nature and society with the application of rational use of natural resources, environmental aspects, and the fundamentals of environmental protection legislation.

SC 04. Proficiency in modern research methods used in industrial and research organizations in the study of the Earth, its geospheres, and their components.

SC 05. Ability to apply knowledge and necessary practical skills in planning, organization, motivation, control, and regulation of the activities of specialized enterprises and institutions.

SC 06. Ability to apply scientific knowledge and practically implement it for the development and implementation of mechanisms of geoplanning and spatial planning, monitoring regional development, and preparing strategic plans and programs.

SC 07. Ability to apply knowledge of cartography; skills in working with statistical databases; collection, generalization, and processing of statistical information and its graphical visualization in geographical research.

SC 08. Ability to apply technical literacy in the field of modern GIS and remote sensing technologies used in industrial and research organizations and institutions in the study of the Earth, its geospheres, and their components.

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1.7. The list of learning outcomes that this discipline forms:

LO 02. Apply one's knowledge to identify and solve problem issues and make well-grounded decisions in Earth sciences.

LO 04. Develop, lead, and manage projects in Earth sciences; evaluate and ensure the quality of work.

LO 06. Be able to carry out environmental assessment, audit, licensing, and certification of natural resource use; forecast the development of environmental, technological, economic, and social consequences at specific natural resource use sites.

LO 07. Know modern methods of studying the Earth and its geospheres and be able to apply them in industrial and research activities.

LO 08. Know the basic principles of management of enterprises in the field of natural resource use, their organization, and production and organizational management structures.

LO 09. Develop and implement mechanisms of territorial management and geoplanning, carry out monitoring of regional development, and prepare plans and programs.

LO 11. Use modern methods of modeling and geoinformation processing in the implementation of innovative activities.

LO 13. Assess the environmental and economic impact on the environment when implementing engineering measures and design environmental protection measures.

LO 14. Comprehensively apply knowledge of cartography; compile and use cartographic products (including web maps) in geographical research and in solving professional tasks.

1.8. Prerequisites: unified entrance exam, specialized exam for admission to the educational program.

2. Thematic plan of the discipline

Section 1. CARTOGRAPHIC BASE FOR SPATIAL PLANNING

Topic 1. Spatial planning: conceptual and terminological system. Essence of the concepts of "spatial development" and "spatial planning". History of development of spatial planning in Ukraine and the world. World and European documents on spatial planning. Spatial planning system in Ukraine.

Topic 2. The essence of the cartographic base for spatial planning. Relationship of spatial planning with geography and cartography. Types, properties and features of cartographic works that serve to substantiate the spatial planning. Cartographic support of development strategies of national, regional and local level. Cartographic support of functional zoning, modeling of protected areas.

Section 2. CARTOGRAPHIC METHOD OF RESEARCH IN SPATIAL PLANNING

Topic 1. Using the cartographic method for analysis and forecasting of the development of the area. Techniques of cartographic research method, used in spatial planning. Determining the required data for solving spatial planning tasks, attributes and data connections. Modeling spatial connections (traffic routing; qualimetric assessment of the area). Analysis of social, economic, ecological condition of the area and its changes over time.

Topic 2. The role and place of geographic information systems (GIS) in spatial planning. GIS as spatial management tool. The use of modern computer technology in spatial planning. Regional GIS. GIS in the municipal administration. GIS-analysis of the location of objects to solve the problems of spatial management: creating interactive maps.

3. The structure of the discipline

Name of sections and topics	Number of hours											
	full-time education						distance education					
	Total	including					Total	including				
		lec	pr	lab		ind		lec	pr	lab		ind
1	2	3	4	5	6	7	8	9	10	11	12	13
Section 1. CARTOGRAPHIC BASE FOR SPATIAL PLANNING												
Topic 1	40	8	8	–	–	24	41	2	1	–	–	38
Topic 2	36	8	8	–	–	20	35	2	1	–	–	32
Total for Section 1	**76**	**16**	**16**	**–**	**–**	**44**	**76**	**4**	**2**	–	–	**70**
Section 2. CARTOGRAPHIC METHOD OF RESEARCH IN SPATIAL PLANNING												
Topic 1	36	8	8	–	–	20	36	2	2	–	–	32
Topic 2	38	8	8	–	–	22	38	2	2	–	–	34
Total for Section 2	**74**	**16**	**16**	**–**	**–**	**42**	**74**	**4**	**4**	–	–	**66**

Total hours	***150***	***32***	***32***	*–*	*–*	***86***	***150***	***8***	***6***	*–*	*–*	***136***

4. Topics of practical classes

№	Name of the topic	Number of hours	
		full-time education	distance education
1	Cartographic substantiation of spatial planning in European countries	8	1
2	Cartographic modeling of the national nature park	8	1
3	Cartographic substantiation of the unification of territorial communities in Ukraine	4	1
4	Analysis of spatial differentiation of united territorial communities	4	1
5	Creating an interactive map of a capable network of primary health care (PHC) provision	4	1
6	Analysis of spatial planning schemes in Ukraine at the regional level	4	1
	Total	**32**	**6**

5. Tasks for individual work

№	Types, content of the individual work	Number of hours	
		full-time education	distance education
1	Study global and European documents on spatial planning: United Nations Human Settlements Programme; European Regional / Spatial Planning Charter (Torremolinos Charter); Guiding Principles for Sustainable Spatial Development of the European Continent; The EU Compendium of Spatial Planning Systems and Policies; Territorial Agenda of the European Union 2020	12	20
2	Deepen knowledge about legislative support of spatial planning in Ukraine, namely: state building norms of Ukraine; General scheme of planning of the territory of Ukraine; types of urban planning documentation; schemes of planning the territory of regions, districts; zoning plans and detailed territorial plans	12	18
3	According to literary sources, deepen knowledge on the topic: properties and features of cartographic works that justify spatial planning	10	16
4	Analyze the cartographic support of regional development strategies of Ukraine to 2020	10	16

5	Find the information on the application of the cartographic method to solve the problems of spatial planning: creating a map of land use for evaluation and planning; monitoring of water supply management of relevant network devices; solving telecommunication problems on the placement of new cellular devices, etc.	10	16
6	In-depth study of the topic: Route planning in ArcGIS	10	16
7	Deepen knowledge of the history of GIS application in applied tasks of spatial management, relevant research and in certain areas of business	10	16
8	According to literature and Internet sources find specific examples of the usage of GIS in regional and municipal management	12	18
	Total	**86**	**136**

6. Individual tasks

Not provided for in working curricula.

7. Teaching methods

The following teaching methods are used: verbal (conversations, lectures), visual (illustration, demonstration), practical (practical work).

Lectures and practical classes during the period of martial law in Ukraine are conducted remotely in the format of videoconferences (Zoom platform). Students are provided with questions for self-assessment and self-control. All materials and the teaching and methodological complex are available in the Office365 environment and on the Moodle platform. Individual and group consultations may be conducted remotely, both synchronously and asynchronously (using messengers, email, etc.).

Students' independent work includes the following types of activities on the above-mentioned topics: studying the theoretical foundations of the lecture material, reviewing individual topics or questions assigned for independent study, in-depth study of literature on the specified topics, searching for additional information, and systematizing the studied material before taking current assessments.

Materials from the book 'The Visual Language of Spatial Planning. Exploring Cartographic Representations for Spatial Planning in Europe' by Stefanie Dühr were used in the lectures on the discipline.

8. Methods of control

Methods of control include: theoretical defense of practical works; current express survey based on lecture topics; participation in discussions during lectures and practical classes; the intermediate test to check the mastering of the discipline material.

For conducting midterm and final assessments, the Moodle platform is used, with student authentication carried out in a videoconference mode with audio and video recording. Registration (admission to the assessment) of participants in the educational

process, as well as the exchange of final assignments and the submission of responses, are carried out exclusively through the corporate email of V.N. Karazin Kharkiv National University, ensuring compliance with the principles of academic integrity.

9. Scoring scheme

Current check and individual work						Final Test	Total
Section 1		Section 2		Intermediate test	Total		
Topic 1	*Topic 2*	*Topic 1*	*Topic 2*				
10	10	15	15	10	60	40	100

In order to be admitted to passing the final test in this academic discipline, the student must score at least **20 points out of 60** during the current check and individual work.

Assessment criteria

Practical works	Number of points	Evaluation criteria
PW1	10	2 points – completeness of the description of the spatial planning system in Europe; 2 points – illustration of the report with cartographic works used in the spatial planning of Europe; 2 points – the quality of the presentation; 2 points – logic and structure of the report; 2 points – answers to questions, participation in the general discussion
PW2	10	2 points – description of the area of NPP modeling; 2 points – justification of the projected boundary of the NNP; 2 points – justification of the choice of sites for the functional zones of the NNP; 2 points – the quality of cartographic materials; 2 points – theoretical defense of the work
PW3	5	2 points – correctness and completeness of the used technique; 2 points – the quality of prepared cartographic materials; 1 point – theoretical defense of the work
PW4	10	4 points – implementation of UTC typing; 4 points – the quality of mapping according to the results of UTC typing; 2 points - theoretical defense of the work
PW5	10	4 points – quality and completeness of the geographical basis; 4 points – mapping of areas covered by the existing network of PHC; 2 points – theoretical defense of the work

PW6	5	2 points – correctness and completeness of the used technique; 2 points – the quality of textual analysis; 1 point – theoretical defense of the work

If a student submits a practical work after the term, they lose 50% of points.

The *intermediate test* is estimated at 10 points and is held on the Moodle platform. The weight of each question is indicated in the test form. The intermediate test consists of test questions (7 points in total) and 1 open-ended question which is worth 3 points. For an open-ended question students get 2 points for the correctness of the content of the answer and 1 point – for the structure and logic of the answer.

The *final test* is estimated at 40 points and is held on the Moodle platform. The weight of each question is indicated in the test form. The final test consists of 10 test questions (1 point each), 10 questions with a short answer (1 point each) and 10 open-ended questions which are worth 2 points each. For open-ended questions students get 1 point for the correctness of the content of the answer and 1 point – for the structure and logic of the answer.

The results of *informal education* (online courses, trainings, internships, civic education programs, etc.) may be recognized by the subject commission and re-enrolled as components of the academic discipline. Submission of documents is before the beginning of the semester. The maximum possible amount of points for re-enrollment of the educational component is **30 points.**

Rating scale
For credits

The sum of points for all types of educational activities during the semester	Score on a national scale (for credits)
90-100	Pass
70-89	
50-69	
1-49	Fail

10. Recommended reading

1. Dühr S. The Visual Language of Spatial Planning. Exploring Cartographic Representations for Spatial Planning in Europe / S. Dühr. – Routledge, 2007. – 216 p. https://www.researchgate.net/publication/254868979_The_Visual_Language_of_Spatial_Planning_Exploring_Cartographic_Representations_for_Spatial_Planning_in_Europe
2. EUROPE 2020: A European Strategy for Smart, Sustainable and Inclusive Growth. – Available at : http://ec.europa.eu/eurostat/web/europe-2020-indicators

3. Von Weizsaecker, E. Come On! Capitalism, Short-termism, Population and the Destruction of the Planet / E. von Weizsaecker, A. Wijkman. – Springer, 2018. – 220 p. https://www.researchgate.net/publication/322179030_Come_On_Capitalism_Short-termism_Population_and_the_Destruction_of_the_Planet
4. Achkasov, A., Popovych , N., Peresadko, V., & Gordeziani, T. (2024). Geoinformation support of geoportals of territorial communities: pre-war realities and post-war prospects. Visnyk of V. N. Karazin Kharkiv National University. Series Geology. Geography. Ecology, (60), 124–136. https://doi.org/10.26565/2410-7360-2024-60-09
5. An Agenda for a Reformed Cohesion Policy. A place-based approach to meeting European Union challenges and expectations. Barka F. 2009. – Available at : http://www.europarl.europa.eu/meetdocs/2009_2014/documents/regi/dv/barca_report_/barca_report_en.pdf
6. Council of Europe. European heritage. Sustainable Development Strategies in South-East Europe / R. Pickard, ed. – Council of Europe Publishing, 2008. – 221 p. https://book.coe.int/en/cultural-heritage/3933-european-heritage-sustainable-development-strategies-in-south-east-europe.html
7. European Environmental Bureau (EEB). EU Sustainable Development Strategy. From Theory to Delivery / J. Hontelez, M. Buntenkamp. – Brussels : European Environmental Bureau, 2006. – 66 p.
8. Indicators of Sustainable Development : Guidelines and Methodologies, 3rd Edition. – UNDESA : New York, 2007. – 93 p. https://www.un.org/esa/sustdev/natlinfo/indicators/guidelines.pdf
9. Popovych N. Sustainable Development Indicators and Possibilities of Their Mapping / N. Popovych // Проблеми безперервної географічної освіти і картографії : зб. наук. пр. – Вип. 24. – Харків : ХНУ, 2016. – С. 135–139. https://oaji.net/articles/2017/4483-1489057075.pdf

11. Links to information sources on the Internet, video lectures, other methodological support

1. Declaration of the United Nations Conference on the Human Environment [Електронний ресурс]. – Available at : http://www.unep.org/Documents.Multilingual
2. Atlas of Sustainable Development Goals 2017. – Available at : http://datatopics.worldbank.org/sdgatlas/
3. European Sustainable Development Network. – Available at : http://www.sd-network.eu/
4. Guiding Principles for Sustainable Spatial Development of the European Continent. – CEMAT, 2000. – Available at : https://rm.coe.int/-the-guiding-principles-for-sustainable-spatial-development-of-the-eur/1680719362
5. Maps and Sustainable Development Goals. – Available at : http://icaci.org/maps-and-sustainable-development-goals/
6. Report of the World Comission on Environment and Development: Our common future. – Available at : http://www.un-documents.net/our-common-future.pdf
7. The United Nations Commission on Sustainable Development / Sustainable Development Knowledge Platform. – Available at : https://sustainabledevelopment.un.org/csd.html