NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

CURRICULUM OF ACADEMIC DISCIPLINE

GEOINFORMATICS, INFORMATICS AND PROGRAMMING

A	G "Engineering, Manufacturing and Construction"
Specialty	G18 Geodesy and land management
Academic programme	
Faculty	
Developed by:	

Kyiv – 2025

Description of the course Geoinformatics, Informatics and Programming

Tasks of discipline are to develop an expert understanding of the prospects for further development and practical use of computer technology, theoretical knowledge and practical computer skills among OS WINDOWS, basic techniques using the Microsoft Office package Office.

Branch of knowledge, direction of education, specialty, educational-qualification level (EQL)	
Educational qualification level	Bachelor
Specialty	G "Engineering, Manufacturing and Construction"
Educational program	Geodesy and Land Management
Description of the course	
Type	Compulsory
Total number of hours	120
Number of credits ECTS	
Number of content modules	
Course project (work)	-
Form of Control	Test, Exam, Exam
Discipline parameters for full-time students and students studied by correspondence	
	Full-time
Year of training	1
Semester	1-2
Lectures	15-15
Practical, seminars	-
Laboratory studies	30-30
Self-dependent work	15-15
Number of weekly hours for full-time study: classroom	2-2

Aim of the discipline "Geoinformatics, Informatics and Programming" is to form in the Python programming.

***A*cquisition of comp...**

Integrated competency (IC)

IC. The ability to solve complex specialized problems of geodesy and land management

- general competencies:

GC01. Ability to learn and master modern knowledge.

GC02. Ability to apply knowledge in practical situations.

GC05. Ability to communicate in a foreign language.

GC06. Ability to use information and communication technologies.

GC07. Ability to work autonomously.

GC08. Ability to work in a team.

GC13. Ability to preserve, multiply moral, cultural, scientific values and achievements of society based on understanding of history, patterns of development of the subject area, its place in the general system of knowledge about nature and society, as well as in the development of society, technology and technology. activities for recreation and healthy living.

- special competencies:

SC04. Ability to select and use effective methods, technologies and equipment for professional activities in the field of geodesy and land management.

SC06. Ability to perform remote, ground, field and in-house research, engineering calculations for processing research results, prepare research results, prepare reports in solving problems of geodesy and land management.

SC07. Ability to collect, update, process, critically evaluate, interpret, store, publish and use geospatial data and metadata on objects of natural and man-made origin.

SC09. Ability to use tools, instruments, equipment, facilities in the performance of geodetic and land management tasks.

SC10. Ability to monitor and evaluate land.

- ***expected learning outcomes (ELO)*:**

2. Organize and manage the professional development of individuals and groups.

3. Communicate information, ideas, problems, solutions, personal experience and arguments to specialists and non-specialists.

4. To know and apply in professional activity normative-legal acts, normative-technical documents, reference materials in the field of geodesy and land management and related branches.

9. Collect, evaluate, interpret and use geospatial data, metadata on objects of natural and manmade origin, apply statistical methods of their analysis to solve specialized problems in the field of geodesy and land management.

10. Select and apply tools, equipment, hardware and software required for remote, terrestrial, field and in-house surveys in the field of geodesy and land management.

11. Organize and perform remote, ground, field and camera work in the field of geodesy and land management, prepare the results of the work, prepare relevant reports.

15. Develop and make effective decisions on professional activities in the field of geodesy and land management

2. Program of the discipline

Modules and topics	Hours											
	full-time study							correspondence				
	weeks	Total	weeks					Total	weeks			
			1	p	lab	ind	s.st.		1	p	lab	ind
1	2	3	4	5	6	7	8	9	10	11	12	13
Semester I												
Module1. Information technologies in geodesy and land management												
Theme 1. Theoretical prerequisites for the study of geoinformatics	1-2	19	2		2		15					
Theme 2. Modern technical means of working with data	3-4	8	2		6							
Theme 3. Digital transformation	5-6	4	2		2							
Total module1		***31***	***6***		***10***		***15***					
Module2. Processing of land management information in word processors												
Theme 4. Use of word processors when performing land management works	7-8	8	2		6							
gT	9-10	4	2		2							
Theme 6. Work with graphic objects in text editors	11-12	6	2		4							
Theme 7 Work with scientific and technical documentation	13-15	11	3		8							
Total module2		***29***	***9***		***20***		***0***					
Total Semester I		**60**	**15**		**30**		**15**					
Semester II												

Module1 (3). Processing of land management information in table processors												
Theme 1 (8). The use of table processors when performing land management works	1-2	23	2		6		15					
Theme 2 (9). Work with formulas and functions in spreadsheet processors	3-4	6	2		4							
Theme 3 (10). Visualization of data in the form of diagrams by means of spreadsheet processors	5-6	6	2		4							
Total module1 (3)		***35***	***6***		***14***		***15***					
Module2 (4). Processing of land management information using high-level programming languages												
Theme 4 (11). Modern programming languages. The basic syntax of the Python language	7 -8	6	2		4							
Theme 5 (12). The concept of control structures in programming. Functions	9-10	6	2		4							
Theme 6 (13). Work with complex data types	11-12		2		4							
Theme 7 (14). Work with files	13-15	8	3		4							
Total module2 (4)		***25***	***9***		***16***		***0***					
Total Semester II		**60**	**15**		**30**		**15**					
Total hours		**120**										

4. Laboratory topics

№	Topic	Hours
Semester I		
Module 1. Information technologies in geodesy and land management		
1	Work in the Windows OS environment. Basic actions with files and folders	2
2	Moodle distance learning information system of the university. Part1	2
3	Moodle distance learning information system of the university. Part 2	2

4	Moodle distance learning information system of the university. Part 3	2
5.	Work with antivirus programs	2
Module 2. Processing of land management information in word processors		
6	Text editing and formatting. Part 1	2
7	Text editing and formatting. Part 2	2
8	Entering special characters in word processor	2
9	Working with tables in word processor	2
10	Work with simple graphic images in the form of flowcharts in text documents	2
11	Working with graphics in word processor	2
12	Work with the formula editor and elementary calculations in word processor	2
13	Work with links and footers in word processor	2
14	Document review in word processor	2
15		2
Total Semester I		***30***
Semester II		
Module 1 (3). Processing of land management information in table processors		
1 (16)	Creation of spreadsheets and data entry in table processor spreadsheet	2
2 (17)	Formatting and editing the table structure in table processor	2
3 (18)	Conditional formatting of table cells	2
4 (19)	Work with formulas in the table processor	2
5 (20)	Working with sheets in the table processor, exchanging data between sheets	2
6 (21)	Table processor: work with diagrams	2
7 (22)	Table processor: creation of value distribution diagrams	2
Module 2 (4). Processing of land management information using high-level programming languages		
8 (23)	Basics of programming in Python	2
9 (24)	Program structure, data, expressions and operations in Python	2
10 (25)	Programming functions in Python	2
11 (26)	Conditional and looping flow control structures in the Python programming language	2
12 (27)	Lists and tuples (records) in Python	2
13 (28)	Arrays in Python	2
14 (29)	Dictionaries and working with files in Python	2
15 (30)	Date and time objects in Python	2
Total Semester II		***30***
Total		**90**

5. **Self-dependent work**

№	Topic	Hours
1.	Working with Google Drive	15
2	Excel Drop Down List using Data Validation and Excel Tables that updates dynamically	15
3.	Maps.visicom.ua is a Ukrainian geospatial data portal	15
	Total	45

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- final test;
- exam;
- module tests;
- essays;
- defence of laboratory work.

7. Teaching methods:

- verbal method (lecture, discussion, interview, etc.);
- practical method (laboratory, practical classes);
- visual method (illustration method, demonstration method);
- work with educational and methodical literature (summarizing, summarizing, annotating, reviewing, writing an abstract);
- video method (remote, multimedia, web-oriented, etc.);
- independent work (task performance).

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	Pyth	
	PRN2	
Maps.visicom.ua – Ukrainian	PRN2,	

9. Teaching and learning aids:

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- Methodologiacal guideline for education practice of discipline з дисципліни «Geoinformatics, informatics and programming» (2 курс) / Л.В. Примак, А.А. Москаленко. – Київ, 2023. – 68 с.
- Методичні рекомендації до виконання лабораторних робіт з дисципліни “Геоінформатика, інформатика й програмування. Частина 2” для студентів ОС «Бакалавр» спеціальності 193 “Геодезія та землеустрій” / Л.В. Примак, А.А. Москаленко, Б.Б. Заячківська, - К., ЦП «КОМПРИНТ», 2024, 138 с.
- Методичні рекомендації до виконання лабораторних робіт з дисципліни “Geoinformatics, Informatics and programming. Part 2” англійською мовою для студентів ОС «Бакалавр» спеціальності 193 “Геодезія та землеустрій” / Л.В. Примак, А.А. Москаленко, Б.Б. Заячківська, - К., ЦП «КОМПРИНТ», 2024, 140 с.
- Конспект лекцій з дисципліни “Геоінформатика, інформатика й програмування. Частина 2” для студентів ОС «Бакалавр» спеціальності 193 “Геодезія та землеустрій” / Л.В. Примак, О.П. Дроздівський, Б.Б. Заячківська, - К., ЦП «КОМПРИНТ», 2024, 167 с.
- Конспект лекцій з дисципліни “Geoinformatics, Informatics and programming. Part 2” англійською мовою для студентів ОС «Бакалавр» спеціальності 193 “Геодезія та землеустрій” / Л.В. Примак, О.П. Дроздівський, Б.Б. Заячківська, - К., ЦП «КОМПРИНТ» 2024, 165 с.
- program of teaching practice of the academic discipline

10. Recommended sources of information

andra L. Arlinghaus, Joseph J. Kerski, Ann Evans Larimore, Matthew Naud. Spatial Thinking in Environmental Contexts. Maps. Maps, Archives, and Timelines. 1st Edition. 2023. 248 p.

авлиш В. А., Гліненко Л. К., Шаховська Н. Б.. Основи інформаційних технологій і систем. Львів: Львівська політехніка. 2018. 620с.

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lexander M., Kusleika D. Microsoft Excel 365 Bible. Wiley 2022. 1072 p.

iлен Лаптон, Дженніфер Коул Філліпс. Графічний дизайн. Нові основи. Київ: ArtHuss. 2019. 262

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oArtHuss. 2022. 288 с.

nрк Лутц. Python. Довідник програміста. Київ: Науковий світ. 2023. 294 с.

ол Беррі. Head First. Python: Легкий для сприйняття довідник. Харків: 2021. 624 с.

ипулін В. Д. Основні принципи геоінформаційних систем: навчальний посібник. Харків: ХНАМГ, 2010. 313 с.

овідник з мови Python. URL: https://docs.python.org/uk/3/reference/index.html