NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Department of Geoinformatics and Aerospace Research of the Earth

APPROVED
Faculty of Land Management
May 15, 2025

CURRICULUM OF ACADEMIC PRACTICE

GEOINFORMATICS, INFORMATICS AND PROGRAMMING

Area of knowledge	G "Engineering, Manufacturing and Construction"
Specialty	G18 Geodesy and land management
Academic programme	"Geodesy and Land Management"
Faculty	Land Management
Developed by:	Assistant Professor, PhD, Bohdanna ZAYACHKIVSKA Assistant Professor, Doctor of Philosophy Anastasiia GORODNYCHA

Kyiv – 2025

Description of the discipline

The first-year internship in the discipline of GEOINFORMATION, INFORMATICS AND PROGRAMMING is a continuation of the study and consolidation of the acquired theoretical knowledge from the course "GEOINFORMATION, INFORMATICS AND PROGRAMMING" and is provided for by the curriculum for specialty 193. Geodesy and Land Management. Its completion is mandatory for every student of the Faculty of Land Management.

The objectives of the practice are to systematize, consolidate, deepen, and generalize the knowledge obtained by first-year students while studying the course, as well as to acquire practical skills in using computer technologies by land surveyors in their practical work.

The purpose of the discipline is to study the possibility of using computer technologies by specialists in geodesy and land management in their practical work.

1. Aim, competencies and program outcomes of the academic discipline

Aim:

It consists in forming in students theoretical knowledge and practical skills in processing data in degrees in MS Excel, acquiring practical skills in the methodology of constructing graphic diagrams and preparing documentation in MS Word.

Task:

− learn how to search using different search engines;
− formation of practical skills in working with data in degrees using MS Excel;
− formation of practical skills in constructing graphic diagrams and preparing documentation in MS Word.

Students who have completed and defended all laboratory and independent work during the theoretical training period are allowed to participate in the practice. The logical conclusion of the practice is a test.
The internship is conducted on the territory of educational building No. 6 of the National University of Life Resources and Environmental Management of Ukraine.

Competencies of the discipline:

- integral competencies :

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

- general competencies (GC) :

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. The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding the 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 engineering, to use various types and forms of physical activity for recreation and leading a healthy lifestyle.

- professional (special) competencies (PC):

SC04. Ability to select and use effective methods, technologies and equipment for carrying out professional activities in the field of geodesy and land management.
SC06. Ability to perform remote, ground, field and office research, engineering calculations for processing research results, formalize research results, prepare reports when solving geodesy and land management tasks.
SC07. Ability to collect, update, process, critically evaluate, interpret, store, publish and use geospatial data and metadata regarding objects of natural and man-made origin.
SC09. Ability to use tools, devices, equipment, and facilities when performing geodesy and land management tasks.

SC10. Ability to monitor and assess land.

Expected learning outcomes (ELO):

ELO2, 3, 4, 9, 10, 11, 15

ELO2. Organize and manage the professional development of individuals and groups.

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

ELO 4. Know and apply in professional activities regulatory and legal acts, regulatory and technical documents, reference materials in the field of geodesy and land management and related industries.

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

ELO 10. Select and apply tools, equipment, facilities, and software necessary for remote, terrestrial, field, and desk-based research in the field of geodesy and land management.

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

ELO 15. Develop and make effective decisions regarding professional activities in the field of geodesy and land management, including under conditions of uncertainty.

2. Methods and means of diagnosing learning outcomes:

– oral or written survey;
– defending of practical works;
– protection of calculation and graphic works.

3. **Teaching methods *:***

– problem-based learning;
– practice-oriented learning;
– teamwork.

PRACTICE BASES

The training practice in the discipline of GEOINFORMATION, INFORMATICS AND PROGRAMMING in the first year of the Bachelor's degree program is conducted on the basis of the Geoinformation Technologies laboratory, which is located in rooms 120, 102, 103 of the educational building No. 6 of the National University of Biology and Chemistry of Ukraine.

ORGANIZATION OF INTERNSHIPS

Internal regulations and safety regulations.

The general management of the practice is carried out by the head of the Department of Geoinformatics and Aerospace Research of the Earth.

Academic study groups are led by department teachers.

The responsibilities of the group leader include:

- drawing up a schedule of training practice for individual types of work;
- explanation of the content of the tasks, issuance of initial data;
- demonstration of the correct methodology for completing tasks;
- monitoring the progress of tasks;
- timely acceptance and evaluation of work performed by students;
- constant supervision of the state of labor discipline, order and organization of students.

Duration of practice for 1st year students, according to the curriculum for specialty 193. Geodesy and Land Management – 5 working days (1 week): work in MS Excel software – 2 days, work with search engines – 1 day, work with MS Word software – 2 days, acceptance and analysis of completed practice tasks.

Familiarization with safety techniques and rules for using the workplace

The main task of occupational safety and health is to prevent the causes that cause accidents at work.

Office processing of survey materials, as well as work on drawing up maps and plans at the current stage of development of technical means of production, requires spending the main part of working time at the computer, and therefore it is necessary to know the rules for safe use of the computer and peripheral devices. The main goal of computer security is to prevent industrial injuries and damage to health.

When performing work on computers, it is necessary to comply with the requirements of general and this labor protection instruction.

Individuals who have passed the test in the discipline "Informatics and Programming", introductory briefing on labor protection, and initial briefing on labor protection at the workplace are allowed to work independently on computers.

While working on computers, the following dangerous and harmful factors may act: physical and psychophysiological.

The main equipment of a computer user's workplace is a monitor, system unit, and keyboard.

When working with text information (in data entry and text editing mode, reading from the screen), the most physiologically correct is the image of black characters on a light (white) background.

The monitor should be placed at the workplace so that the screen surface is in the center of the field of vision at a distance of 400-700 mm from the user's eyes. It is recommended to place the elements of the workplace so that the eyes are at the same distance from the screen, keyboard, text. In order to relieve eye strain, it is recommended to look away from the monitor every half hour and look at distant objects.

A comfortable working posture when working with a computer is ensured by adjusting the height of the desk, chair and footrest. A rational working posture can be considered a position in which the operator's feet are located horizontally on the floor or footrest, the hips are oriented in a horizontal plane, and the upper arms are vertical. The angle of the elbow joint varies within 70-90°, the wrists are bent at an angle of no more than 20°, and the head is tilted 15-20°.

To neutralize static electricity charges in a room where work is done on computers, including laser and LED printers, it is recommended to increase the humidity of the air using room humidifiers. It is not recommended to wear clothing made of synthetic materials.

To maintain eye health, it is recommended to:

✓ turn the monitor so that it is comfortable to look at the screen - at a right angle (not from the side) and slightly from top to bottom, while the screen should be slightly tilted, its lower edge closer to the operator;

✓ screen brightness – not less than 100Kd/m2;

✓ the ratio of the monitor brightness to the brightness of the surrounding surfaces in the work area is no more than 3:1;

✓ the minimum size of the glow dot is no more than 0.4 mm for a monochrome monitor and no less than 0.6 mm for a color monitor, the contrast of the sign image is no less than 0.8;

✓ the resolution must be at least 768X640 pixels per inch, and the frame rate must be at least 75 Hz;

✓ If any malfunctions are detected, do not start work until the negative factors have been eliminated.

Safety requirements during work:

✓ it is necessary to place the keyboard stably on the desktop, preventing it from shaking;

✓ while working, sit straight, do not strain. A rationally selected work chair or armchair, which can be easily adjusted to your figure, helps to maintain the correct position when working with a computer. The back of the chair should support the lower half of the back, but at the same time be rigidly fixed so as not to hinder movements during work;

✓ To prevent adverse effects on the user of devices such as a "mouse", a large, free table surface should be provided for moving the "mouse" and for comfortable support of the elbow joint;

✓ Extraneous conversations and irritating noises are not allowed;

✓ the user is individually responsible for the sanitary, technical condition and staffing of the workplace;

✓ If you smell or/and see any visible signs of smoke, you must immediately notify the teacher or system administrator and disconnect the device from the power supply. If necessary, use a fire extinguisher;

✓ Periodically, when the computer is turned off, remove dust from the surfaces of the equipment with a cotton cloth slightly moistened with soapy water. Wipe the VDT screen and protective screen with a cloth moistened with alcohol. Do not use liquid or aerosol cleaners to clean the computer surfaces.

It is prohibited:

✓ Use the workplace without the permission of the system administrator, head of department, or teacher.

✓ Turn the computer on and off independently.

✓ Repair equipment yourself.

✓ Place any objects on the computer equipment;

✓ Do not cover the ventilation holes of the equipment with anything, which may lead to its overheating and failure.

✓ Use programs and information that are not used in the task at hand.

✓ Record or rewrite the program and information without the permission of the system administrator and teacher.

✓ It is strictly forbidden to change computer options and settings.

To remove static electricity, it is recommended to touch metal surfaces from time to time.

Safety requirements after completion of work:

✓ finish and save a file in progress to the computer's memory;

✓ Turn off the printer and other peripheral devices. Unplug the power cords from the outlets.

✓ clean the workplace;

✓ wash your hands thoroughly with warm water and soap;

✓ turn off the air conditioning, lighting and general power supply;

To avoid serious problems with the spine, it is recommended to work at the computer for no more than six hours a day, and to do gymnastics for thirty minutes every two hours.

You need to adjust the height of the keyboard to choose the most comfortable angle for yourself.

You need to take regular short breaks from working on the keyboard with massage and hand warming up, which really helps eliminate unpleasant sensations in the upper extremities.

PRACTICE CONTENT

No. s/n	Types of work	Scope and content of the work	Number of hours
1	2	3	4
1	Information collection and analysis	Selection and analysis of information according to the option	5
2	Calculating the coordinates of diagonal run points in table processor	Building a table, filling in data according to the option, using formulas and absolute references when calculating coordinates. Features of working with data in degrees.	5
3	Calculating the area of a plot analytically in table processor	Building a table, filling it with data, applying formulas and links between different sheets of a workbook.	3
4	Construction of graphic diagrams	Using text processor to create diagrams and outlines	2
5	Creating a report	Report creation with the addition of tables, diagrams and formulas	10
6	Submitting a practice report and receiving credit		2
			Total 25 hours

INDIVIDUAL TASKS

During the internship, each student receives an individual task according to the option. The results of the internship are presented in the form of a report.

Options for completing individual tasks are provided in Appendices A, B, and C.

METHODOLOGICAL RECOMMENDATIONS

Task: Calculating the coordinates of diagonal run points in MS Excel

1. Create a new workbook in your working folder (check with your teacher)

2. Create a template for the coordinates of the theodolite course (see Table 1) and write down the values of the internal angles, horizontal alignment and coordinates from Appendix A (check with your teacher for the option).

3. Calculate the coordinate increments using the formulas:

$$X2 = X1 + \Delta X1-2$$

$$Y2 = Y1 + \Delta Y1-2$$

4. Find the directional angles of the sides of the theodolite course using the formulas:

$$\Delta X = S \cos \alpha,$$

$$\Delta Y = S \sin \alpha,$$

Note: if the directional angle is in the II and III quadrants, then 180º must be added to the angle, if in IV, then 360º

5. Calculate the direction angles using the formula:

$$\alpha_i = \alpha_{i-1} - 180 + \beta_{left}$$

Note: if the direction angle value is less than 0º or more than 360º, add or subtract 360º accordingly.

6. Find the coordinate increments using the formulas:

$$\Delta X = S \cos \alpha,$$

$$\Delta Y = S \sin \alpha,$$

7. Find the coordinates using the formulas:

$$X_n = X_{n-1} + \Delta X_{(n-1)-n}$$

$$Y_n = Y_{n-1} + \Delta Y_{(n-1)-n}$$

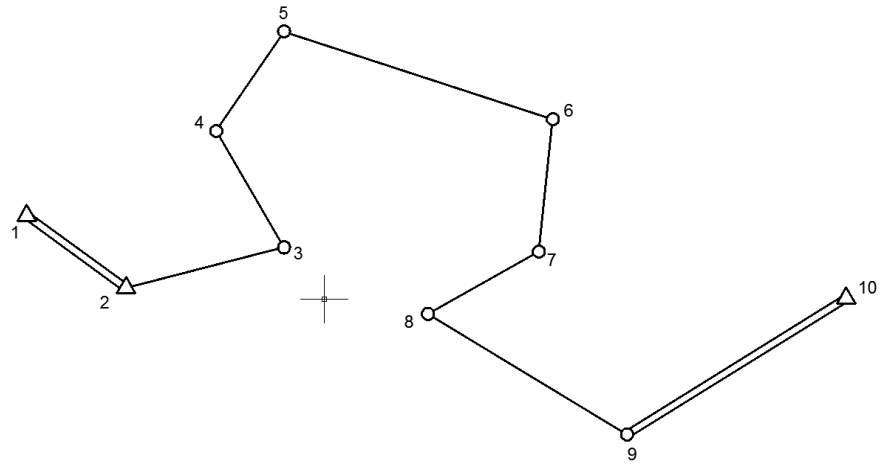

Fig. 1. Scheme of theodolite travel

Table 1

Knowledge of the coordinates of theodolite travel

Point number	Internal corners	Directional angles	Horizontal laying	Increments		Coordinates	
				ΔX	ΔY	X	Y
1						**X_1**	**X2**
			S_{1-2}				
2	**β_2**					**X2**	**Y2**
			S_{2-3}				
3	**β_3**						

4	**β 4**		**S 3-4**				
			S 4-5				
5	**β 5**						
			S 5-6				
6	**β 6**						
			S 6-7				
7	**β 7**						
			S 7-8				
8	**β 8**						
			S 8-9				
9	**β 9**						
			S 9-10				
10						**X10**	**Y10**

* - source data in Appendix A, please check with your teacher for the option

Task: Calculating the area of a plot analytically in MS Excel

Calculate the area of the land plot formed within points 3-8 (Fig. 2), using the coordinates from the previous task.

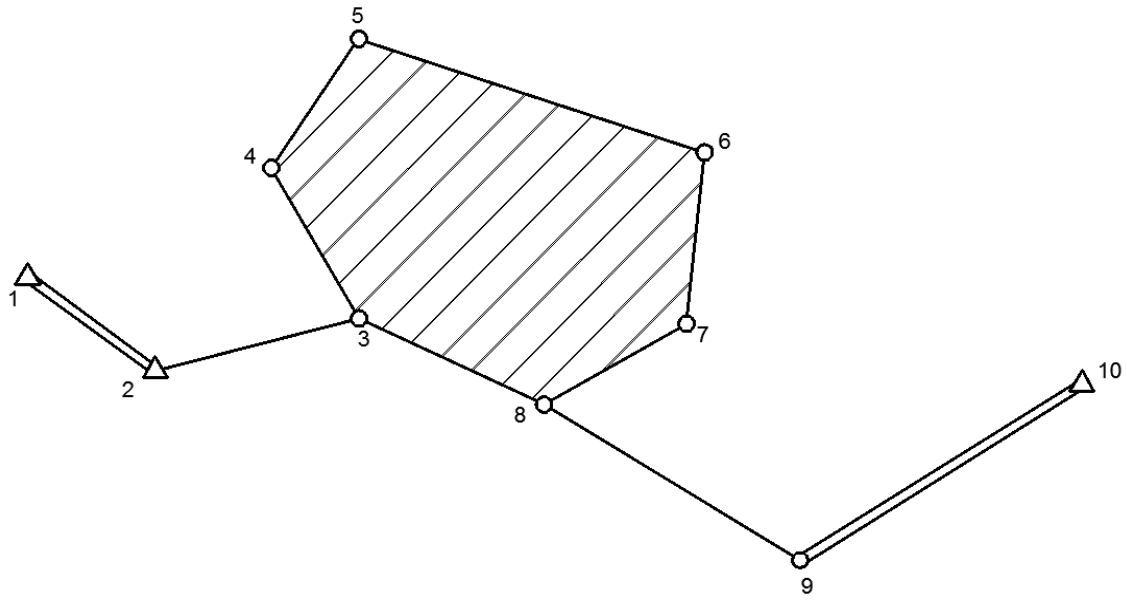

Fig. 2 Scheme of the land plot

Table 2

Knowledge of calculating area analytically

No. of vertic	Vertex coordinates		Coordinate differences		Achievements	
	X	Y	$Yn_{+1}-Yn_{-1}$	$Xn_{-1}-Xn_{+1}$	$X_n*(Y_{n+1}-Y_{n-1})$	$Y_n*(X_{n-1}-X_{n+1})$

e s						
1						
2						
3						
4						
5						
6						
Double the area of the plot in meters						

Write the area in hectares, rounding the value to the fourth digit.

Task: Creating a report "Characteristics of a land plot located in the _____ natural and agricultural region"

Create a text document in your working folder.

The first section should contain a description of the district (Appendix B, check with the teacher for the option), and the second should contain a description of the work performed in tasks 1 and 2.

The text work should have the following content:

Introduction (what is natural-agricultural zoning, what is it for, etc.)
SECTION 1. CHARACTERISTICS OF ... NATURAL AND AGRICULTURAL DISTRICT
1.1 Description
1.2 Territorial coverage (which administrative districts and settlements are included)
SECTION 2. NORMATIVE-METHODICAL PRINCIPLES OF NORMATIVE MONETARY VALUATION OF LAND PARCEL AND TAXATION
2.1 Calculation of the normative monetary value
2.2 Tax rates
CHAPTER 3. ECONOMIC CHARACTERISTICS OF AGRICULTURAL LAND USE
3.1 Agricultural land use structure
3.2 Analysis of agricultural land use over the past 5 years
SECTION 4. NORMATIVE MONETARY ASSESSMENT OF A LAND PARCEL
4.1. Closed theodolite path
4.2 Calculation of the area of the land plot by analytical method
4.3 Diagonal course and land plot diagrams
4.4 Calculation of the normative monetary valuation of a land plot

Below is the approximate content of each section:

Administrative-territorial structure: number of cities, towns, villages, area of the district, coat of arms, date of creation, history (the text must be accompanied by illustrations: ATU map, symbols, etc.)

Geographical location: region, adjacent lands, size, area, distance from economic and administrative centers, location scheme in the region.

Climate: average annual temperatures, amount of precipitation, number of days with temperatures above +10°C, humidity (the text should be accompanied by illustrations and tables: maps of climatic zones, maps of temperatures, precipitation, etc.).

Relief and soils: common landforms, predominant soils.

Hydrographic network and surface waters: total area of the water mirror, rivers of the region, their length and fullness, volume of annual runoff.

Flora and fauna: typical representatives of flora and fauna (illustrations).

Population: age composition of the population, ratio of men to women in the district (show in diagrams), population density, national composition of the district.

Economy: production sectors represented in the district, the most powerful production centers and their brief characteristics, the state of agriculture in the district.

Ecological state of the natural environment: assessment of the ecological state of the region, environmental problems of the region, energy-saving and energy-saving technologies applied in the region.

Calculation of the coordinates of the diagonal travel points: the tables for calculating the theodolite travel with a description of the work and the formulas used during the calculation are inserted from the previous work.

Calculation of the area of the plot using an analytical method: inserted from the previous work tables for calculating the area using an analytical method with a description of the work, and the formulas used during the calculation and a diagram of the land plot made using a rafik.

Requirements for document preparation:

Title page

The title page of the work is drawn up in accordance with Appendix B.

1 paragraph “National University of Life Resources and Environmental Management of Ukraine” Font – TimesNewRoman; style – bold; size – 14 pt.; all letters are capitalized; center alignment, no left indentation; no spacing before the paragraph; single line spacing.

2nd paragraph "Department of Geoinformatics and Aerospace Research of the Earth"

Font – TimesNewRoman; style – italic; size – 14 pt.; center alignment, no left indentation; no spacing before the paragraph; single line spacing.

3rd paragraph "Report"

Font – TimesNewRoman; style – regular; size – 26 pt.; all letters are capitalized; center alignment, no left indentation; paragraph spacing – 222 pt; line spacing – single.

Paragraph 4 "on the subject:"

Font – TimesNewRoman; style – regular; size – 16 pt.; center alignment, no left indentation; no spacing before the paragraph; single line spacing.

Paragraph 5 "Characteristics of the land plot located in _____ district "

Font – TimesNewRoman; style – regular; size – 16 pt.; center alignment, no left indentation; no spacing before the paragraph; single line spacing.

6th paragraph "Completed by: st. 1-z/v-2"

Font – TimesNewRoman; style – regular; size – 14 pt.; left alignment, left indent 9.5 cm.; spacing before paragraph 138 pt.; line spacing – single.

7th paragraph "Ivanov I.I."

Font – TimesNewRoman; style – regular; size – 14 pt.; left alignment, left indent 9.5 cm.; no spacing before the paragraph; line spacing – single.

8th paragraph "Checked by: assistent."

Font – TimesNewRoman; style – regular; size – 14 pt.; left alignment, left indent 9.5 cm.; no spacing before the paragraph; line spacing – single.

Paragraph 9 "Zayachkivska B.B."

Font – TimesNewRoman; style – regular; size – 14 pt.; left alignment, left indent 9.5 cm.; no spacing before the paragraph; line spacing – single.

10th paragraph "Kyiv - 2026"

Font – TimesNewRoman; style – regular; size – 14 pt.; center alignment, no left indentation; paragraph spacing 114 pt.; line spacing – 1.15.

Content

The table of contents is presented at the beginning of the work. It contains the names and initial page numbers of all sections, subsections, and paragraphs (if they have a title), including the introduction, conclusions to sections, general conclusions, appendices, and a list of references.

The main part

Formatting the main text

The main part of the work consists of sections, subsections, paragraphs, and sub-paragraphs. Each section begins on a new page. A period is not placed at the end of the title of a section, subsection, or paragraph.

The margins should have the following parameters: left - 30 mm, right - 15 mm, top - 20 mm, bottom - 20 mm, page orientation - portrait.

The names of sections, subsections, and paragraphs are formatted with styles. Styles must be created and meet the following parameters:

Heading 1a: Arial font, 24 pt, bold, all capital letters, center alignment, line spacing 1.3, indent before paragraph 12 pt, indent after paragraph 24 pt, first line indent, left and right spacing is left, automatic numbering within the entire document.

Heading 2a: Arial font, 18 pt, bold, center alignment, line spacing 1.2, indent before paragraph 12 pt, indent after paragraph 6 pt, first line indent, no left and right spacing, automatic numbering within the section.

Heading 3a: Times New Roman font, 16 pt, bold italic, left alignment, line spacing 1.5, paragraph indent 6 pt, first line indent, no left and right spacing, automatic numbering within the subsection.

Such structural parts of the work as the table of contents, list of symbols, introduction, conclusions, list of sources used do not have a serial number.

Subsections are numbered within each section. The subsection number consists of the section number and the ordinal number of the subsection, between which a period is placed. The subsection number must end with a period, for example: "2.3." (the third subsection of the second section). Then, on the same line, the subsection title is given.

Paragraphs are numbered within each subsection. The paragraph number consists of the serial numbers of the subsection section, paragraph, between which a period is placed. There must be a period at the end of the number, for example: "1.3.2." (the second paragraph of the third subsection of the first section). Then, on the same line, the paragraph title is given.

The formatting of the main text must comply with the following parameters: Times New Roman font, 14 pt, width alignment, line spacing 1.5, indentation of the first line of the paragraph 1.25 cm, no indents before, after, on the left, or on the right of the paragraph.

Page numbering

The page number is not placed on the title page, on subsequent pages the number is placed in the lower right corner of the page without a period at the end. The page number format should comply with the parameters: Times New Roman 8 pt, bold italic.

Illustration, tables and formulas

Illustrations (photographs, drawings, diagrams, graphs, maps) and tables must be presented in the dissertation immediately after the text, where they are mentioned for the first time, or on the next page. Illustrations and tables placed on separate pages of the work are included in the general page numbering. Illustrations and tables are numbered sequentially within the document using the "Insert Title" function, with the exception of objects presented in the appendices.

Illustrations are designated by the word "Fig." "Fig." The illustration number, its title, and explanatory captions are placed sequentially below the illustration.

For example:

Fig.3 Image title

References to illustrations are placed in the form of an expression in parentheses "(Fig. 3)" or a phrase such as: "...as can be seen from Fig. 3" or "...as shown in Fig. 3".

Tables are numbered consecutively (except for tables presented in the annexes). In the upper right corner above the corresponding table title, the inscription "Table" is placed, indicating the number.

For example:

Table 2

Table name

Each table should have a title, which is placed above the table and printed symmetrically to the text. The title and the word "Table" begin with a capital letter. The title is given in bold.

Headings of graphs in cells should begin with capital letters, subheadings with small letters if they form one sentence with the heading, and with capital letters if they are independent. The height of the lines should be at least 8 mm.

A table with a large number of rows can be moved to the next page using the "Repeat header rows" function.

All tables of the work must be referenced in the text, with the word "table" in the text written in abbreviated form, for example: "...in table 1.2".

In repeated references to tables and illustrations, the abbreviated word "see" should be indicated, for example: "see Table 1.3".

Formulas in the work are numbered within the document. Formula numbers are written near the right margin of the sheet at the level of the corresponding formula in parentheses.

Example:

A+B=C (3.1)

The decoding of the symbols is written directly below the formula in the sequence in which they are given in the formula.

The value of each symbol and numerical coefficient must be entered on a new line.

The first line of the explanation begins with the word "where" without a colon.

Equations and formulas should be separated from the text by blank lines. At least one blank line should be left above and below each formula.

Applications

It is advisable to include supporting material in the annexes, if necessary.

Appendixes should be indicated sequentially in capital letters of the Ukrainian alphabet, with the exception of the letters G, E, I, Y. Y, O, Ch, B. The word appendix is aligned to the right edge and highlighted in bold.

For example:

Appendix A

List of sources used

The list of sources used should be placed in one of the following ways: in the order of appearance of references in the text (most convenient for use), in alphabetical order of the surnames of the first authors or titles.

The bibliographical description of sources is compiled in accordance with current standards for library and publishing (DSTU 7.1:2006).

A reference in the text is indicated by a number in square brackets, after the reference text.

For example:

Reference text [1].

The text must contain drawings, tables (one table must be located on a sheet with landscape orientation), lists (numbered, bulleted, multi-level), text in 2 columns, formulas.

MATERIAL, TECHNICAL, EDUCATIONAL AND METHODOLOGICAL SUPPORT FOR STUDENTS' PRACTICE.

Practical training in the discipline of GEOINFORMATION, INFORMATICS AND PROGRAMMING in the first year of the Bachelor's degree program is conducted on the basis of the Geoinformation Technologies laboratory, which is located in rooms 120, 102, 103 of the educational building No. 6 of the National University of Life Sciences of Ukraine. The laboratory is equipped with computers with installed software that fully meets the requirements of the practice.

The educational and methodological support for students' educational practice is:

- "Regulations on the Practice of Students in Higher Educational Institutions of Ukraine", approved by the order of the Ministry of Education of Ukraine dated "08" April 1993 No. 93 and registered with the Ministry of Justice of Ukraine "30" April 1993 under No. 35
- educational program;
- working curriculum;
- work program of the discipline;
- textbooks and study guides;
- instructional and methodological materials for performing the cycle of work specified in the internship program;
- individual tasks for independent work of students in academic disciplines.

REPORT REQUIREMENTS.

The report must contain

Introduction (what is natural-agricultural zoning, what is it for, etc.)
SECTION 1. CHARACTERISTICS OF ... NATURAL AND AGRICULTURAL DISTRICT
1.1 Description
1.2 Territorial coverage (which administrative districts and settlements are included)
SECTION 2. NORMATIVE-METHODICAL PRINCIPLES OF NORMATIVE MONETARY VALUATION OF LAND PARCEL AND TAXATION
2.1 Calculation of the normative monetary value
2.2 Tax rates
CHAPTER 3. ECONOMIC CHARACTERISTICS OF AGRICULTURAL LAND USE
3.1 Agricultural land use structure
3.2 Analysis of agricultural land use over the past 5 years
SECTION 4. NORMATIVE MONETARY ASSESSMENT OF A LAND PARCEL
4.1. Closed theodolite path
4.2 Calculation of the area of the land plot by analytical method
4.3 Diagonal course and land plot diagrams
4.4 Calculation of the normative monetary valuation of a land plot

The report must be prepared in accordance with the methodological recommendations given in the relevant section.

The report is checked and approved by the internship supervisors from the university. The internship is summarized in the form of a test (interview), during which the teacher analyzes the diary report on the student's activities, the supervisor's feedback from the internship base, and draws conclusions about the level of knowledge acquisition and skills acquisition in accordance with the RPNP.

A student who has not completed the internship program and received an unsatisfactory feedback based on the internship, an unsatisfactory grade when writing the report, is sent for internship again during the vacation period or is expelled from the university.

4. Results assessment.

The knowledge of a higher education applicant is assessed on a 100-point scale and is converted into a national assessment in accordance with the current "Regulations on Examinations and Tests at the NUBiP of Ukraine"

Educational activity	Results	Assessment
Module 1. **Information technologies in geodesy and land management**		
Task 1 . Information collection and analysis	ELO2, 3, 4, 9, 10, 11, 15. Know the rules for searching for information and understand the features of working with search engines	**20**
Task 2. Calculating the coordinates of diagonal move points in the program of table processor	ELO2, 3, 4, 9, 10, 11, 15. Know constructing a table for a diagonal move, understand features of working with data in degrees Be able to apply formulas and use functions to convert the use of formulas and absolute references when calculating coordinates	**20**
Task 3. Analytical calculation of the area of the **plot** in a way program of table processor Construction of graphic diagrams	ELO2, 3, 4, 9, 10, 11, 15. Know how to construct a table for calculating area Understand the sequence of filling tables with data Be able to apply formulas Use links between different pages of a book and know the capabilities of text processor for building diagrams and outlines Understand the sequence of use text processor for creating diagrams and outlines	20
Task 4. Formatting text	ELO2, 3, 4, 9, 10, 11, 15. Know the formatting capabilities of text processor and understand the sequence of use text processor for text formatting Be able to format text	**20**
Task 5. Creation and submission of report	ELO2, 3, 4, 9, 10, 11, 15. Know the capabilities of text processor for creating reports and use link to text documentation, know about creating reports	**20**
Teaching practice		**100**
Total per course		**(Teaching practice) ≤ 100**

Student's rating, points	National grading	
	exams	**credits**
90-100	perfectly	enrolled
74-89	good	
60-73	satisfactorily	
0-59	unsatisfactorily	not included

6.3.Assessment policy

Deadline and resubmission policy	Deadlines are specified in the ENC. Works submitted after the deadline without good reason will be given a lower grade. Modules may be retaken with the permission of the lecturer if there are good reasons (for example, sick leave).

Academic Integrity Policy	Plagiarism during independent work, testing and assessment is prohibited (including using mobile devices). Abstracts must have correct text references to the literature used
Visitation Policy	Attendance at classes is mandatory. For objective reasons (e.g. illness, international internship), training may be conducted individually (in a remote on-line form in agreement with the dean of the faculty).

5. **Teaching and learning aids:**

- e-learning course of the discipline - https://elearn.nubip.edu.ua/course/view.php?id=706;
- 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.

6. Recommended sources of information

Main:

1. Sandra 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.
2. Bolstad P., Manson S. GIS Fundamentals: A First Text on Geographic Information System. 7th Edition. 2022. 764 p.
3. Павлиш В. А., Гліненко Л. К., Шаховська Н. Б.. Основи інформаційних технологій і систем. Львів: Львівська політехніка. 2018. 620с.

Additional:

4. James Holler. The Microsoft Office 365 Bible: The Most Updated and Complete Guide to Excel, Word, PowerPoint, Outlook, OneNote, OneDrive, Teams, Access, and Publisher from Beginners to Advanced. 2022. 359 p.
5. Alexander M., Kusleika D. Microsoft Excel 365 Bible. Wiley 2022. 1072 p.
6. Еллен Лаптон, Дженніфер Коул Філліпс. Графічний дизайн. Нові основи. Київ: ArtHuss. 2019. 262 с.
7. Берінато С. Хороші діаграми. Поради, інструменти та вправи для кращої візуалізації даних. Київ: ArtHuss. 2022. 288 с.
8. Марк Лутц. Python. Довідник програміста. Київ: Науковий світ. 2023. 294 с.
9. Пол Беррі. Head First. Python: Легкий для сприйняття довідник. Харків: 2021. 624 с.
10. Шипулін В. Д. Основні принципи геоінформаційних систем: навчальний посібник. Харків: ХНАМГ, 2010. 313 с.
11. Moodle Documentation. URL: https://docs.moodle.org/403/en/Main_page
12. Word help & learning. URL: https://support.microsoft.com/en-us/word
13. Excel help & learning. URL: https://support.microsoft.com/en-us/excel
14. Довідник з мови Python. URL: https://docs.python.org/uk/3/reference/index.html
15. Online IDE - Code Editor, Compiler, Interpreter. URL: https://www.online-ide.com/

Appendix A

	Option 1	**Option 2**	**Option 3**	**Option 4**	**Option 5**	**Option 6**	**Option 7**	**Option 8**
β 2	137° 45'	133° 32'	131° 14'	133° 39'	128° 58'	134° 32'	132° 19'	132° 37'
β 3	82° 36'	80° 19'	85° 59'	77° 42'	79° 47'	76° 10'	82° 56'	77° 54'
β 4	235° 8'	242° 54'	237° 15'	242° 21'	242° 8'	243° 2'	237° 43'	242° 59'
β 5	252° 49'	246° 17'	249° 29'	247° 33'	249° 4'	249° 27'	248° 17'	248° 45'
β 6	256° 54'	253° 43'	254° 44'	252° 57'	259° 49'	260° 26'	259° 22'	256° 8'
β 7	237° 23'	243° 54'	240° 8'	244° 59'	235° 27'	238° 21'	235° 38'	240° 28'
β 8	57° 55'	56° 41'	59° 39'	55° 31'	57° 28'	54° 4'	59° 17'	55° 26'
β 9	120° 15'	119° 59'	117° 29'	119° 37'	120° 58'	120° 15'	118° 20'	120° 3'
S 1-2	973.40	956.59	1005.64	977.50	1027.40	1029.43	1003.71	1009.25
S 2-3	1390.37	1373.17	1374.37	1478.36	1387.70	1431.27	1386.52	1363.26
S 3-4	1151.47	1140.45	1183.02	1199.93	1118.63	1124.56	1166.99	1208.37
S 4-5	1063.57	1106.03	1068.84	1119.39	1145.34	1115.94	1125.20	1136.89
S 5-6	2378.02	2395.84	2419.12	2389.79	2411.04	2419.77	2322.41	2358.35
S 6-7	962.02	913.52	940.18	877.46	953.22	870.79	938.96	912.45
S 7-8	967.75	942.85	910.75	857.28	965.54	903.32	953.51	865.05
S 8-9	1858.87	1926.64	1894.02	1954.34	1912.73	1853.17	1982.18	1846.80
S 9-10	2159.98	2303.74	2176.88	2199.77	2271.03	2241.84	2288.76	2289.98
X 1	14700.00	14817.08	14764.19	14756.60	14719.62	14760.34	14741.70	14735.08
Y 1	18400.00	18425.74	18451.01	18412.54	18447.77	18476.64	18434.11	18436.33
X2	14240.72	14334.16	14228.38	14213.20	14139.24	14220.68	14183.40	14170.16
Y2	19258.24	19251.48	19302.02	19225.08	19295.54	19353.28	19268.22	19272.66

16.

	Option 9	**Option 10**	**Option 11**	**Option 12**	**Option 13**	**Option 14**	**Option 15**	**Option 16**
β 2	138° 41'	133° 45'	136° 59'	132° 39'	132° 5'	133° 60'	132° 55'	133° 54'
β 3	82° 43'	86° 1'	82° 21'	82° 16'	86° 57'	80° 44'	80° 55'	82° 3'
β 4	238° 43'	238° 28'	242° 21'	238° 51'	238° 27'	242° 37'	238° 31'	242° 47'
β 5	249° 9'	248° 54'	246° 52'	247° 54'	246° 43'	250° 40'	248° 21'	246° 28'
β 6	254° 52'	255° 49'	259° 9'	257° 33'	260° 36'	258° 43'	258° 5'	256° 35'
β 7	244° 37'	240° 47'	237° 35'	241° 23'	240° 1'	237° 37'	239° 48'	238° 11'
β 8	53° 11'	54° 53'	58° 24'	55° 11'	53° 27'	54° 17'	58° 6'	57° 29'
β 9	120° 51'	120° 8'	118° 37'	119° 40'	119° 47'	120° 5'	117° 38'	118° 36'
S 1-2	1028.55	1077.17	1051.11	1020.12	1060.73	1070.47	1032.30	1061.47
S 2-3	1458.21	1441.79	1420.31	1405.88	1480.60	1478.00	1439.52	1356.97
S 3-4	1165.92	1176.19	1115.18	1061.48	1162.72	1170.20	1202.25	1127.94
S 4-5	1142.01	1074.00	1146.87	1047.01	1031.22	1002.77	1116.44	1061.37
S 5-6	2404.29	2343.50	2377.86	2345.64	2417.63	2318.24	2397.52	2345.33
S 6-7	878.12	922.85	938.56	864.59	891.54	932.92	850.86	950.11
S 7-8	979.82	917.17	1012.21	869.32	910.45	895.49	866.78	926.40
S 8-9	1864.75	1932.97	1968.81	1987.85	1981.08	1939.68	1988.58	1888.68
S 9-10	2260.35	2307.71	2247.34	2218.74	2222.40	2228.79	2221.65	2292.54
X 1	14846.83	14779.53	14840.19	14746.44	14759.58	14787.26	14741.23	14746.63
Y 1	18523.34	18543.08	18545.20	18456.87	18512.74	18539.68	18468.00	18505.81
X2	14393.66	14259.06	14380.38	14192.88	14219.16	14274.52	14182.46	14193.26
Y2	19446.68	19486.16	19490.40	19313.74	19425.48	19479.36	19336.00	19411.62

18.

	Option 17	**Option 18**	**Option 19**	**Option 20**	**Option 21**	**Option 22**	**Option 23**	**Option 24**
β 2	132° 20'	133° 57'	132° 26'	130° 55'	129° 57'	132° 26'	133° 15'	138° 12'
β 3	79° 16'	79° 21'	83° 54'	83° 48'	83° 46'	82° 28'	86° 48'	82° 9'
β 4	239° 23'	238° 59'	237° 15'	240° 8'	236° 35'	234° 31'	235° 35'	239° 51'
β 5	252° 53'	252° 26'	250° 25'	250° 1'	252° 33'	253° 54'	249° 8'	245° 35'
β 6	257° 30'	256° 17'	257° 60'	258° 28'	257° 53'	259° 39'	260° 32'	260° 44'
β 7	238° 30'	246° 26'	236° 9'	240° 55'	237° 16'	234° 54'	237° 8'	233° 27'
β 8	56° 35'	51° 30'	58° 7'	53° 46'	59° 10'	57° 23'	57° 26'	59° 26'
β 9	119° 30'	119° 44'	120° 41'	118° 49'	118° 59'	118° 59'	117° 46'	119° 10'
S 1-2	1047.58	1027.79	1031.01	1080.24	964.58	966.86	964.47	1016.78
S 2-3	1391.03	1476.56	1460.68	1388.71	1473.21	1420.02	1427.87	1394.33
S 3-4	1192.01	1178.36	1154.95	1082.77	1127.22	1167.51	1169.21	1127.72
S 4-5	1119.54	1122.75	1032.54	1088.52	1081.10	1087.60	991.78	1058.63
S 5-6	2385.21	2381.37	2379.78	2424.51	2354.59	2347.60	2282.86	2386.05
S 6-7	936.80	896.16	965.24	890.37	921.44	917.66	992.28	932.96
S 7-8	1001.54	943.14	933.24	916.65	914.04	978.18	875.95	890.64
S 8-9	1895.22	1996.71	1862.42	1982.41	1900.44	1858.19	1962.47	1897.05
S 9-10	2242.65	2153.89	2298.09	2245.80	2217.14	2175.80	2212.83	2291.44
X 1	14747.85	14784.14	14768.48	14735.82	14783.03	14773.77	14827.52	14813.60
Y 1	18490.26	18488.95	18483.44	18521.20	18414.35	18411.11	18440.81	18492.89
X2	14195.70	14268.28	14236.96	14171.64	14266.06	14247.54	14355.04	14327.20
Y2	19380.52	19377.90	19366.88	19442.40	19228.70	19222.22	19281.62	19385.78

20.

	Option 25	**Option 26**	**Option 27**	**Option 28**	**Option 29**	**Option 30**	**Option 31**	**Option 32**
β 2	132° 22'	136° 24'	134° 37'	130° 49'	134° 46'	133° 4'	135° 35'	135° 1'
β 3	77° 32'	81° 52'	75° 1'	82° 25'	79° 53'	77° 30'	84° 51'	79° 14'
β 4	245° 3'	234° 12'	244° 3'	236° 49'	242° 4'	239° 60'	239° 32'	243° 50'
β 5	245° 10'	251° 58'	249° 8'	251° 46'	248° 19'	252° 33'	246° 19'	248° 17'
β 6	260° 6'	257° 47'	259° 28'	256° 6'	262° 5'	259° 57'	260° 37'	256° 56'
β 7	237° 59'	238° 14'	234° 56'	239° 8'	239° 10'	233° 17'	238° 12'	237° 42'
β 8	55° 55'	58° 6'	59° 59'	58° 14'	53° 10'	57° 39'	55° 26'	58° 12'
β 9	118° 16'	119° 59'	118° 36'	119° 38'	120° 25'	120° 23'	119° 7'	118° 46'
S 1-2	1015.16	1050.27	967.43	1066.13	941.01	1026.39	1012.78	1010.07
S 2-3	1415.96	1428.76	1371.69	1452.80	1478.33	1356.78	1378.63	1384.11
S 3-4	1087.64	1156.12	1112.56	1098.84	1103.80	1122.23	1164.63	1141.12
S 4-5	1087.13	1103.82	1031.00	1036.53	1031.98	1058.54	1115.40	1087.22
S 5-6	2403.84	2381.92	2406.22	2337.75	2352.74	2384.63	2407.94	2347.60
S 6-7	905.92	946.62	933.62	934.44	861.84	900.71	951.82	982.20
S 7-8	874.23	936.60	936.29	937.89	838.37	914.84	885.44	901.04
S 8-9	1970.79	1854.15	1965.18	1859.18	1873.82	1923.25	1947.18	1961.69
S 9-10	2182.75	2266.84	2243.10	2243.02	2211.44	2272.85	2306.22	2287.12
X 1	14726.59	14777.95	14794.05	14715.67	14847.89	14742.68	14828.22	14794.03
Y 1	18437.71	18511.34	18424.58	18491.74	18425.29	18461.90	18496.19	18474.21
X2	14153.18	14255.90	14288.10	14131.34	14395.78	14185.36	14356.44	14288.06
Y2	19275.42	19422.68	19249.16	19383.48	19250.58	19323.80	19392.38	19348.42

22.

	Option 33	**Option 34**	**Option 35**	**Option 36**	**Option 37**	**Option 38**	**Option 39**	**Option 40**
β 2	136° 27'	136° 38'	137° 30'	133° 19'	130° 31'	132° 40'	138° 8'	136° 59'
β 3	81° 47'	80° 51'	78° 19'	80° 17'	80° 48'	77° 23'	79° 48'	81° 57'
β 4	237° 11'	240° 38'	244° 44'	237° 47'	237° 22'	245° 15'	242° 7'	238° 38'
β 5	249° 20'	246° 9'	248° 47'	250° 4'	251° 35'	247° 16'	245° 36'	248° 35'
β 6	259° 11'	256° 50'	256° 32'	257° 51'	260° 28'	258° 56'	261° 23'	256° 39'
β 7	240° 24'	241° 52'	241° 20'	241° 25'	235° 47'	241° 1'	237° 21'	244° 37'
β 8	52° 12'	52° 59'	54° 53'	57° 12'	58° 15'	53° 11'	57° 6'	52° 11'
β 9	121° 1'	123° 35'	120° 24'	116° 42'	119° 48'	117° 54'	119° 26'	117° 5'
S 1-2	1046.05	950.41	1009.68	1074.68	999.18	1009.56	1040.79	947.41
S 2-3	1469.15	1434.73	1479.16	1441.83	1414.64	1397.81	1393.74	1442.98
S 3-4	1107.20	1061.17	1152.96	1131.64	1140.14	1165.60	1074.37	1188.75
S 4-5	1024.71	1035.08	1114.35	998.05	1131.63	1088.02	1101.68	1127.03
S 5-6	2401.31	2414.46	2352.91	2342.79	2406.97	2403.95	2387.02	2422.06
S 6-7	858.20	855.28	911.58	964.49	853.57	984.34	942.04	965.59
S 7-8	940.00	981.30	927.54	895.39	986.46	931.79	973.60	902.10
S 8-9	1903.67	1932.91	1985.12	1875.49	1895.66	1863.84	1881.37	1950.76
S 9-10	2221.41	2254.17	2245.66	2273.80	2191.66	2243.94	2227.78	2241.22
X 1	14767.67	14822.45	14830.60	14717.75	14736.74	14755.66	14799.34	14832.45
Y 1	18500.47	18421.72	18493.93	18503.28	18425.29	18450.24	18512.46	18424.00
X2	14235.34	14344.90	14361.20	14135.50	14173.48	14211.32	14298.68	14364.90
Y2	19400.94	19243.44	19387.86	19406.56	19250.58	19300.48	19424.92	19248.00

24.

	Option 41	**Option 42**	**Option 43**	**Option 44**	**Option 45**	**Option 46**	**Option 47**	**Option 48**
β_2	131° 31'	133° 21'	134° 50'	136° 30'	137° 13'	128° 18'	135° 14'	135° 47'
β_3	82° 3'	84° 2'	81° 12'	78° 49'	78° 23'	84° 31'	81° 29'	85° 14'
β_4	240° 10'	238° 20'	237° 49'	237° 42'	240° 2'	241° 52'	234° 60'	239° 7'
β_5	246° 16'	250° 49'	249° 48'	254° 42'	250° 46'	245° 43'	252° 58'	248° 3'
β_6	256° 29'	259° 11'	258° 44'	253° 40'	261° 11'	261° 2'	258° 5'	257° 27'
β_7	240° 8'	236° 49'	240° 41'	239° 36'	233° 43'	234° 44'	237° 3'	241° 18'
β_8	59° 22'	56° 16'	54° 31'	58° 17'	59° 55'	56° 6'	58° 16'	56° 14'
β_9	117° 23'	118° 5'	120° 1'	120° 50'	118° 39'	120° 56'	120° 11'	116° 55'
S_{1-2}	983.82	959.37	997.26	994.34	1019.11	1009.68	1076.59	1026.56
S_{2-3}	1486.23	1457.00	1389.25	1428.19	1381.83	1474.07	1459.35	1377.80
S_{3-4}	1085.49	1189.14	1134.74	1094.23	1160.95	1160.37	1139.66	1146.45
S_{4-5}	1044.39	1153.43	996.78	1072.97	1046.95	1078.66	1113.68	1069.36
S_{5-6}	2384.52	2442.50	2376.21	2358.20	2282.99	2385.68	2429.66	2429.14
S_{6-7}	935.84	899.97	880.98	903.02	892.46	869.89	916.51	907.71
S_{7-8}	906.21	920.90	981.15	925.95	883.59	991.51	949.18	929.13
S_{8-9}	1944.36	1948.10	1948.71	1875.26	1840.46	1933.35	1865.67	1933.40
S_{9-10}	2201.93	2251.36	2148.89	2193.32	2255.54	2232.51	2223.56	2221.78
X_1	14753.13	14822.64	14782.13	14814.70	14828.77	14729.05	14755.02	14837.86
Y_1	18417.82	18432.18	18452.25	18467.87	18503.62	18432.75	18528.46	18516.65
X2	14206.26	14345.28	14264.26	14329.40	14357.54	14158.10	14210.04	14375.72
Y2	19235.64	19264.36	19304.50	19335.74	19407.24	19265.50	19456.92	19433.30

26.

	Option 49	**Option 50**	**Option 51**	**Option 52**	**Option 53**	**Option 54**	**Option 55**	**Option 56**
β 2	131° 4'	135° 12'	134° 9'	134° 40'	133° 46'	137° 23'	132° 40'	132° 13'
β 3	82° 27'	83° 39'	79° 15'	82° 57'	77° 9'	79° 16'	85° 58'	83° 29'
β 4	240° 56'	238° 49'	242° 59'	240° 35'	242° 34'	240° 23'	236° 26'	238° 46'
β 5	249° 44'	248° 51'	245° 32'	248° 18'	251° 27'	249° 46'	251° 10'	250° 40'
β 6	256° 17'	259° 24'	258° 48'	258° 19'	255° 30'	258° 47'	254° 43'	256° 11'
β 7	240° 43'	243° 23'	244° 16'	244° 10'	240° 34'	238° 36'	246° 9'	242° 53'
β 8	57° 21'	52° 41'	51° 57'	51° 0'	55° 33'	53° 14'	52° 32'	54° 56'
β 9	117° 11'	115° 48'	119° 24'	119° 21'	119° 54'	119° 41'	117° 59'	117° 6'
S 1-2	954.83	986.79	1063.20	1010.16	1019.66	1042.09	1022.99	1091.34
S 2-3	1435.96	1373.86	1472.74	1397.58	1451.99	1407.50	1446.58	1502.05
S 3-4	1120.54	1118.00	1204.97	1205.68	1109.60	1182.94	1174.59	1184.92
S 4-5	1042.08	1021.06	1042.89	1053.00	1064.02	1047.10	1137.01	1081.01
S 5-6	2422.56	2319.87	2308.34	2396.04	2405.76	2334.93	2400.58	2330.79
S 6-7	960.25	938.02	885.86	912.43	914.52	921.29	929.92	934.19
S 7-8	890.75	932.17	937.33	899.14	914.11	900.45	953.09	905.06
S 8-9	1955.15	1930.99	1966.93	1902.13	1906.85	1954.04	1942.14	1889.52
S 9-10	2210.22	2194.26	2245.33	2274.71	2227.09	2246.49	2181.00	2242.17
X 1	14799.57	14837.60	14734.38	14834.23	14774.48	14788.46	14796.96	14725.32
Y 1	18413.18	18471.75	18500.26	18496.37	18473.80	18507.90	18490.76	18527.77
X2	14299.14	14375.20	14168.76	14368.46	14248.96	14276.92	14293.92	14150.64
Y2	19226.36	19343.50	19400.52	19392.74	19347.60	19415.80	19381.52	19455.54

28.

	Option 57	**Option 58**	**Option 59**	**Option 60**	**Option 61**	**Option 62**	**Option 63**	**Option 64**
β 2	129° 16'	134° 44'	138° 42'	130° 48'	132° 50'	137° 55'	131° 59'	139° 32'
β 3	83° 46'	79° 11'	81° 36'	82° 47'	79° 56'	81° 53'	79° 42'	81° 58'
β 4	236° 16'	245° 2'	236° 3'	237° 59'	240° 41'	238° 31'	237° 58'	238° 41'
β 5	252° 0'	245° 31'	251° 54'	251° 1'	250° 6'	251° 0'	252° 8'	246° 50'
β 6	258° 34'	260° 0'	260° 8'	255° 54'	259° 35'	255° 54'	257° 11'	259° 30'
β 7	237° 20'	233° 50'	236° 49'	239° 57'	236° 56'	244° 40'	237° 17'	238° 42'
β 8	59° 41'	62° 45'	55° 53'	57° 6'	55° 58'	54° 17'	58° 40'	57° 35'
β 9	117° 8'	115° 7'	120° 49'	120° 37'	120° 47'	116° 47'	118° 50'	119° 53'
S 1-2	995.31	1082.76	1008.78	978.81	1076.35	1040.90	1038.67	1063.78
S 2-3	1430.31	1470.49	1430.22	1492.42	1461.63	1461.71	1455.23	1485.40
S 3-4	1126.44	1206.22	1167.08	1149.98	1139.77	1217.94	1213.66	1154.22
S 4-5	1118.59	1100.05	1120.80	1094.50	1081.45	1084.98	1079.66	1121.18
S 5-6	2339.93	2395.08	2399.88	2441.61	2396.27	2302.10	2442.93	2348.40
S 6-7	968.79	873.88	908.55	868.82	931.15	944.10	951.97	983.70
S 7-8	877.01	932.66	970.40	936.94	853.95	864.34	892.10	916.47
S 8-9	1958.89	1900.20	1859.18	1971.19	1854.15	1893.52	1878.65	1956.11
S 9-10	2301.49	2190.14	2128.88	2254.29	2162.05	2240.99	2190.47	2254.45
X 1	14754.76	14754.67	14849.17	14761.18	14737.47	14847.18	14714.08	14816.60
Y 1	18432.68	18535.41	18502.44	18417.16	18517.66	18537.24	18457.63	18547.60
X2	14209.52	14209.34	14398.34	14222.36	14174.94	14394.36	14128.16	14333.20
Y2	19265.36	19470.82	19404.88	19234.32	19435.32	19474.48	19315.26	19495.20

30.

Appendix B

NATIONAL UNIVERSITY OF BIORESOURCES AND NATURE MANAGEMENT OF UKRAINE

Department of Geoinformatics and Aerospace Research of the Earth

Report
on the topic:
"Characteristics of the land plot located within the
_____natural-agricultural region »

Performed by: st. 1-z/v-2
Ivanov I.I.
Checked by: Ph.D.
Zayachkivska B.B.

Kyiv – 2026

Appendix B

№	Природно-сільськогосподарський р-н
1	Шацький (01)
2	Ратнівсько- Любешівський (02)
3	Зарічненський (01)
4	Старосільський (07)
5	Маневицький (03)
6	Турійсько-Ковельський (04)
7	Ківерцівський (05)
8	Володимирецький
9	Костопільсько- Сарненський (03)
10	Рокитнівський (08)
11	Яворівський (05)
12	Кам'янсько-Бузький
13	Радехівський (07)
14	Золочівський (08)
15	Радзивилівський (04)
16	Плосківсько-
17	Будеразький (06)
18	Приіквинський (01)
19	Олевський (01)
20	Лугинський (02)
21	Овруцький (03)
22	Малинський (04)
23	Коростенський (05)
24	Красилівсько- Ушомирський (06)
25	Баранівсько- Червоноармійський
26	Черняхівський (08)
27	Чорнобильсько- Бородянський (01)
28	Вишгородський (02)
29	Славутський (02)
30	Київ (01)
31	Середино-Бузький
32	Шосткинський (02)
33	Ріпкинсько- Корюківський (01)
34	Городнянсько- Семенівський (02)
35	Коропський (03)
36	Менський (04)
37	Козелецько- Сосницький (05)
38	Луцький (06)
39	Сокальський (01)
40	Рівненський (09)
41	Корецький (10)
42	Ганнопільський (01)
43	Городоцький (02)
44	Борщовицький (03)
45	Перемишлянський
46	Заложцівсько- Кременецький (02)
47	Тернопільський (03)
48	Лановецько- Гримайлівський (04)
49	Рогатинський (01)
50	Бережанський (05)
51	Тлумацький (02)
52	Городенківський (03)
53	Чортківський (06)
54	Заліщицький (07)
55	Кицьмансько- Кельменецький (01)
56	Новоград- Волинський (12)
57	Жмеринський (05)
58	Могилів-Подільський
59	Ямпільський (07)
60	Крижопільський (08)
61	Балтський (01)
62	Красноокнянський
63	Віньковецький (05)
64	Чемеровський (06)
65	Хмельницько- Липовецький (01)
66	Погребищенсько- Оратівський (02)
67	Вінницький (03)
68	Немирівський (04)
69	Теплицько- Чечельницький (09)
70	Чуднівський (09)
71	Андрушівський (10)
72	Ружинський (11)

73	Брусилівський (13)
74	Фастівський (06)
75	Сквирський (07)
76	Білоцерківсько- Миронівський (08)
77	Тетіївсько- Богуславський (10)
78	Ульянівський (01)
79	Новоархангельсько- Олександрівський
80	Добровеличківський
81	Маловисківський
82	Кривозерський (01)
83	Ізяславський (03)
84	Старокостянтинівський
85	Теофіпольсько- Ярмолинецький (07)
86	Шполянський (04)
87	Звенігородський (05)
88	Жашківський (06)
89	Маньківський (07)
90	Тальнівський (08)
91	Трипільсько-Букринський (09)
92	Світловодський (03)
93	Канівсько- Чигиринський (03)
94	Бориспільський (03)
95	Яготинський (05)
96	Семенівсько-Кременчуцький (02)
97	Правобережний (03)
98	Гребінківський (04)
99	Глобинський (09)
100	Кобеляцький (10)
101	Буринський (04)
102	Драбівський (01)
103	Черкаський (02)
104	Ніжинсько- Бахмацький (06)
105	Бобровицький (08)
106	Карлівський (01)
107	Чорнухинський (05)
108	Миргородський (06)
109	Зіньківсько-Решетилівський (07)
110	Диканський (08)

111	Глухівський (03)
112	Недригайлівський
113	Липоводолинсько- Білопольський (06)
114	Варвинсько- Талалаєвський (07)
115	Прилуцький (09)
116	Тростянецький (07)
117	Ахтирський (08)
118	Валківський (01)
119	Харківський (02)
120	Великобурлуцький
121	Арцизький (06)
122	Верхньодніпровський
123	П'ятихатський (07)
124	Софіївсько- Томаківський (08)
125	Апостоловський (09)
126	Кіровоградський (06)
127	Онуфрієвський (07)
128	Новгородківський
129	Устинівський (09)
130	Доманівсько- Арбузинський (02)
131	Вознесенський (03)
132	Єланецько- Казанський (04)
133	Великомихайлівсько-Миколаївський (03)
134	Роздільнянський (04)
135	Комінтернівський
136	Куйбишевський (03)
137	Запорізький (04)
138	Оріхівський (05)
139	Приорельський (11)
140	Зачепилівсько- Близнюківський (04)
141	Балаклійський (05)
142	Слов'янський (01)
143	Шахтарський (03)
144	Волновахський (04)
145	Старобешівський
146	Білокуракинський
147	Новоайдарський (03)

148	Біловодський (04)
149	Придонецький (05)
150	Куп'янський (06)
151	Луганський (01)
152	Красногвардійський
153	Володарсько- Тельманівський (06)
154	Ізмаїльський (07)
155	Царичанський (01)
156	Магдалинівський
157	Новомосковський
158	Павлоградський (04)
159	Синельниківсько- Покровський (05)
160	Новоодеський (05)
161	Баштансько- Снігурівський (06)
162	Одеський (08)
163	Бериславський (01)
164	Веселівський (01)
165	Приморський (02)
166	Михайловський (06)
167	Нижньосірогозький
168	Чорноморський (01)
169	Червоногвардійський
170	Сакський (03)
171	Керченський (04)
172	Джанкойський (05)
173	Мелітопольський
174	Очаківський (07)
175	Білозерський (03)
176	Цюрупинський (04)
177	Скадовський (05)
178	Чаплинський (06)
179	Генічеський (07)
180	Івано-Франківський
181	Косівський (06)
182	Дрогобицький (09)
183	Самбірсько-Жидачівський (10)
184	Сокирнянський (02)

185	Чернівецький (03)
186	Сторожинецький (04)
187	Воловецько- Рахівський (04)
188	Верховинський (07)
189	Турківський (11)
190	Путильський (05)
191	Берегівський (01)
192	Середнянсько- Королівський (02)
193	Іршавсько- Тячівський (03)
194	Сімферопольський
195	Горний (08)
196	Севастополь (01)
197	Південнобережний