


NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL SCIENCES OF UKRAINE

Department of "Geoinformatics and Aerospace Research of the Earth"

**APPROVED**
Dean of the Faculty of Land management
O. Ievsiukov
«18» May 2022 y.

APPROVED by department of
Geoinformatics and Aerospace Research
of the Earth
Protocol № 12 from 27 April 2022 y.
Head of department
S.S. Kohan — S.S. Kohan

AGREED
Guarantor of the educational program
I.P. Kovalchuk I.P. Kovalchuk.

PROGRAMME

of the discipline
Geoinformatics, Informatics and Programming

Branch of knowledge	19 Architecture and Construction
Specialty	193 Geodesy and Land management
Educational program	"Geodesy and Land Management"
Faculty	Land Management
Created by	Associate prof., PhD, Drozdivskiyi O.P.

1. Description of the course
Geoinformatics, Informatics and Programming

Branch of knowledge, direction of education, specialty, educational-qualification level (EQL)	
Educational qualification level	Bachelor
Specialty	193 Geodesy and Land management
Educational program	Geodesy and Land Management
Description of the course	
Type	Compulsory
Total number of hours	180
Number of credits ECTS	6
Number of content modules	8
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	1-2
Semester	1-2-3
Lectures	15-15-15
Practical, seminars	-
Laboratory studies	30-30-30
Independent work	15-15-15
Individual tasks	-
Number of weekly hours for full-time study: classroom	2-2-2

2. Goal and tasks of the discipline Geoinformatics, Informatics and Programming

Aim of the discipline: The course provides the ability to use computer technology experts in their practical work.

Tasks of discipline is 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, abilities and skills to create static Web - pages using hypertext Markup Language HTML, writing a program using high-level language C ++. At the end of the course, study the foundations of geoinformatics, which form students' knowledge related to the study of geospatial as a holistic system of diverse objects with their properties and various ways of visualization.

Students after study of the course should:

Know:

- modern information technologies in geodesy and land management;
- methods of processing of information in text editors;
- methods of processing of information in table processors;
- methods of storage of information in databases;
- approaches for visualization information in presentations;
- technologies for the processing of information using high-level programming languages;
- methods for presenting of land-based information on the Internet;
- general concepts of geoinformatics.

be able to:

- apply computer technology to solve practical problems of any kind, such as:
 - obtaining information, education, communication;
 - working with the information systems, online, e-mail;
 - creating and processing text documents, spreadsheets, presentations, graphics, static web-pages of their own programs of calculation, translation;
 - database: storage, processing and finding the right information;
- describe the objects of the environment according to the general concepts of geoinformatics;
- use the acquired knowledge and skills to further the study subjects GIS.

The discipline provides the formation of a number of competencies:

- 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.

SC05. Ability to use modern information, technical and technological support to solve complex issues 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.

learning results:

LR2. Organize and manage the professional development of individuals and groups.

LR3. Communicate information, ideas, problems, solutions, personal experience and arguments to specialists and non-specialists.

LR4. 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.

LR5. Apply conceptual knowledge of natural and socio-economic sciences in performing tasks of geodesy and land management.

LR9. Collect, evaluate, interpret and use geospatial data, metadata on 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.

LR10. 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.

LR15. Develop and make effective decisions on professional activities in the field of geodesy and land management, including under conditions of uncertainty.

3. Program of the discipline Geoinformatics, Informatics and Programming

SEMANTIC MODULE I. INFORMATION TECHNOLOGIES

Theme 1. Introduction

Informatics as a science, history of its occurrence and connection with other sciences, constituents and main components, classification, methods of presentation and coding of information.

Theme 2. Hardware

History of Computers. General structure and functions of the computer, peripheral hardware.

Theme 3. Digital transformation.

Digital citizenship. Digital gap. Smart places. Data-based decision making.

SEMANTIC MODULE 2. PROCESSING IN TEXT EDITORS

Theme 4. Use of text editors

Modern technology of text information processing. Structure of textual information. Microsoft Office suite of applications.

Theme 5. Editing and formatting text. Work with large documents

Navigation in a document. Document view modes. Work on the document windows. Text elements styles. Editing and formatting text information.

Theme 6. Working with tables in text editors

Basic definitions and rules for using tables. Creating, editing, formatting and properties of tables. Work with large tables.

Theme 7. Insert and create graphic objects. Use templates and create forms

Classification and rules for the use of graphic objects in text documents. Creating, adding, editing, formatting and properties of graphic objects.

SEMANTIC MODULE 3. PROCESSING IN TABLE PROCESSORS

Theme 8. Use of table processors

Basic concepts of spreadsheets. Modern technologies for the processing of statistical information. Basic techniques for working with spreadsheets in MS Excel. Rules for naming individual and cell ranges.

Theme 9. Work with formulas and functions in MS Excel

Formula and function. Priority of operations in formulas. The absolute and relative cell references. Creating and editing formulas and functions. Libraries of standard functions in MS Excel. Classification of errors in formulas and functions.

Theme 10. Work is with diagrams in MS Excel

The aim and purpose of modern approaches to data visualization. General classification and basic concepts of charts and graphs. Creating, editing, formatting and properties of charts and diagrams.

SEMANTIC MODULE 4. DATABASES

Theme 11. Methods of storage of large volumes

Basic definitions of relational databases. Purpose and functions of database management systems. Types of objects and structure of DBMS MS Access. Creating tables and database schemas, field properties. Data entry.

Theme 12. Processing in databases

Sorting and filtration of data. Concept of query, classification of queries in MS Access. Creation of queries.

Theme 13. Creating custom forms and reports in database management systems

Purpose and function of forms and reports. Ways of creating and forms and reports. Structure and work with key elements of forms and reports.

**SEMANTIC MODULE 5.
DISPLAYING INFORMATION IN PRESENTATIONS**

Theme 14. Creating and setting up presentations

The concept, kinds and types of presentations. Components of electronic presentation. Creating a presentation MS PowerPoint. Views of the structure of the presentation. Work with slide presentations. Working with text, spreadsheets and graphic tools. Ways to control the appearance of the presentation - templates, layouts, patterns, color schemes. Demonstration of presentation with MS PowerPoint.

**SEMANTIC MODULE 6.
PROCESSING USING HIGH-LEVEL PROGRAMMING LANGUAGES**

Theme 15. High level programming language C ++. The integrated development environment

Programming languages: purpose, classification, compilers, compilers, interpreters. Purpose and classification of integrated development environments. Fundamentals of programming in C ++: characters and main tokens, data types, expressions and operations. The structure of the program.

Theme 16. The concept of control structures in programming. Function libraries

Control structures of linear passage, selection and repetition. Functions: definition, declaration, call and transfer of arguments to a function, specifying argument data types, function prototypes and recursion. Libraries of standard functions.

Theme 17. Work is with the data structures in the language of C++

Arrays. Files. Pointers.

**SEMANTIC MODULE 7.
DISPLAYING INFORMATION ON THE INTERNET**

Theme 18. Basics of Web Design. Markup text information

World Wide Web and its destination. Browsers. HTML document format. Web pages and Web sites. Tags and attributes. Working with text in HTML.

Theme 19. Interpage navigation, markup of graphical and tabular information, custom forms

Graphic files are in the Web of documents. Hypertext references, their settings and structure. Internal and external references. Presentation of the structure of tables by facilities of HTML. Forms of user

Theme 20. Basics of webpage styling

Basic CSS concepts: rules, selectors, properties, values, imitation and cascading.

**SEMANTIC MODULE 8.
BASICS OF GEOINFORMATICS**

Theme 8. General concepts of geoinformatics

Geographic tasks. Geographical phenomena. Domains and elements of geographic information. Communication geoinformatics with other sciences.

4. Structure of the discipline

Modules and topics	hours											
	full-time						by correspondence					
	weeks	total	including					total	including			
			lectures	practs	labs.	ind.	self work		L	P	Labs	Ind.
Semester I												
SEMANTIC MODULE 1. Information technologies												
Theme 1. Introduction	1	19	2		2		15					
Theme 2. Hardware	3	6	2		4							
Theme 3. Digital transformation	5	4	2		2							
Total by Semantic module		29	6		8		15					
SEMANTIC MODULE 2. Processing in text editors												
Theme 4. Use of text editors	7	6	2		4							
Theme 5. Editing and formatting text. Work with large documents	9	6	2		4							
Theme 6. Working with tables in text editors	1 1	8	2		6							
Theme 7 Insert and create graphic objects. Use templates and create forms	1 3	11	3		8							
Total by Semantic module		31	9		22		0					
Total by semester		60	15		30		15					
Semester II												
SEMANTIC MODULE 3. Processing in table processors												
Theme 8. Use of table processors	1	23	2		6		15					
Theme 9 Work with formulas and functions in MS Excel	3	4	2		2							
Theme 10. Work is with diagrams in MS Excel	5	8	2		4							
Total by Semantic module		33	6		12		15					
SEMANTIC MODULE 4. Databases												
Theme 11. Methods of storage of large volumes	7	6	2		4							
Theme 12. Processing in databases	9	6	2		4							
Theme 13. Creating custom forms and reports in database management systems	1 1	8	2		6							
Total by Semantic module		20	6		14		0					
SEMANTIC MODULE 5. Displaying information in presentations												
Theme 14. Creating and setting up presentations	1 5	7	3		4							
Total by Semantic module		7	3		4		0					
Total by semester		60	15		30		15					

Modules and topics	hours											
	full-time							by correspondence				
	weeks	total	including					total	including			
			lectures	practs	labs.	ind.	self work		L	P	Labs	Ind.
Semester III												
SEMANTIC MODULE 6. Processing information using high-level programming languages												
Theme 15. High level programming language C ++. The integrated development environment	1	6	2		4							
Theme 16. The concept of control structures in programming. Function libraries	3	6	2		4							
Theme 17. Work is with the data structures in the language of C++	5	6	2		4							
Total by Semantic module		18	6		12							
SEMANTIC MODULE 7. Displaying information on the Internet												
Theme 18. Basics of Web Design. Markup text information	7	21	2		4		15					
Theme 19. Interpage navigation, markup of graphical and tabular information, custom forms	9	6	2		4							
Theme 20. Basics of webpage styling	1 1	6	2		4							
Total by Semantic module		33	6		12		15					
SEMANTIC MODULE 8. Basics of geoinformatics												
Theme 21. General concepts of geoinformatics	1 3	9	3		6							
Total by Semantic module		9	3		6							
Total by semester		60	15		30		15					
Total		180	45		90		45					

5. Topics of seminars

№	Topic	Hours

6. Topics of practical classes

№	Topic	Hours

7. Topic of laboratory classes

№	Topic	Hours
SEMANTIC MODULE 1. Information technologies in geodesy and land management		
1	Work in the Windows environment. Key actions with files and folders	2
2	Moodle University Distance Learning Information Systems. Part 1	2
3	Moodle University Distance Learning Information Systems. Part 2	4
4	Work with antivirus programs	4
SEMANTIC MODULE 2. Processing of information in text editors		
5	Editing and formatting text in a MS Word text editor	2
6	Introduction of special characters in MS Word	2
7	Working with tables and drawings in MS Word	2
8	Create complex graphic images in MS Word	2
9	Work with footnotes and a list of literature in MS Word	2
10	Work with headers in MS Word	2
11	Working with form editor and elementary calculations in MS Word	2
12	Reviewing the document in MS Word	4
SEMANTIC MODULE 3. Processing of information in table processors		
13	Create spreadsheets and input data in the MS Excel spreadsheet	2
14	Formatting and editing table structures in MS Excel	2
15	Working with formulas in MS Excel	4
16	Work with charts and diagrams in MS Excel	4
SEMANTIC MODULE 4. Land-based information and databases		
17	Working with tables in the MS Access database management system	4
18	Use queries in MS Access	2
19	Working with forms in MS Access	2
20	Create reports in MS Access	4
SEMANTIC MODULE 5. Displaying of land management information in presentations		
21	Create presentations in MS PowerPoint	2
22	Setting up a presentation in MS PowerPoint	4
SEMANTIC MODULE 6. Processing of land management information using high-level programming languages		
23	Integrated Development Environment (IDE) Code :: Blocks. The concept of the C ++ project	2
24	The structure of the program, data, expressions and operations in C ++	2
25	Control structures in C ++	2
26	Use standard and create your own functions in C ++	2
27	Working with arrays and files in C ++	2
28	Operations with files in C ++	2
SEMANTIC MODULE 7. Displaying of land management information on the Internet		
29	Creating websites using Denver's local server	2
30	Structure of the Web document. Working with text and lists in HTML	2
31	Working with links and images in HTML	2
32	Working with tables and forms in HTML	2
33	Styling HTML-document means CSS: headlines and paragraphs	2
34	Styling HTML-document means CSS: lists and tables	4
SEMANTIC MODULE 8. Basics of geoinformatics		
35	Modeling the environment	4

8. Self-dependent work

No	Topic	Hours
1	2	3
1.	Working with Google Drive	15
2	Excel Drop Down List using Data Validation and Excel Tables that updates dynamically	15
15.	The modern CSS frameworks	15
	Total	45

9. Control Questions

Content module 1

1. Define information.
2. What is studying computer science?
3. Which classes shared information?
4. What are the units of information?
5. What is the carrier of information?
6. What are the types of information?
7. The concept of information system.
8. Move the block diagram of a computer.
9. Describe the basic principles of computer (von Neumann principles).
10. What does RAM?
11. What information is stored in permanent memory?
12. What is cache?
13. What does the CPU?
14. What are the main characteristics of the processor?
15. What are the types of printers?
16. What are the main features of the monitor?
17. The concept of encoding information.
18. How will the information is in the computer?
19. Principles of encoding text information.
20. What code graphic information?
21. How is color-coded?
22. Define the concept of a file.
23. What are the components of the file name?
24. What does the operating system?
25. What is the shell? Give examples.
26. What programs relating to the application? Give examples.
27. What are the translators?
28. What is included in the software package Microsoft Office?

Content module 2

1. What does the text editor?
2. Purpose and functionality of Microsoft Word.
3. What are the main characters of the formatting in Microsoft Word?
4. What are the basic paragraph formatting options in the program Microsoft Word?
5. What do you know page formatting options in the program Microsoft Word?
6. What is the method of entering text in a text editor Microsoft Word?
7. What are the basics of creating documents in Microsoft Word?
8. The concept of a template to use it. Template Normal.
9. The concept of the table. The main ways to create tables in Microsoft Word.
10. Formatting tables.
11. What operations can be performed with fragments of a text editor Microsoft Word?
12. What is the list? Species lists.
13. Formatting Lists in Microsoft Word.
14. What types of images are used in Microsoft Word?
15. What the picture can be placed in relation to the text in Microsoft Word?

Content module 3

1. Purpose and main functions of the program Microsoft Excel.
2. What can I do with a worksheet in Microsoft Excel?

3. Types of addressing the program Microsoft Excel.
4. What are the data types used in Microsoft Excel?
5. The concept of formulas and functions in Microsoft Excel.
6. Using formulas in Microsoft Excel.
7. How to build a chart in Microsoft Excel?
8. What are the types of diagrams that are used in Microsoft Excel, and define its scope.
9. The data analysis in Microsoft Excel.
10. Use the filters in an environment Microsoft Excel.

Content module 4

1. What is a database?
2. Which classes are divided Database?
3. What is a relational database?
4. What are the different types of relationships between tables?
5. What internal and external key?
6. What is the structure of a table in a relational database?
7. What are the main characteristics and capabilities DBMS Access?
8. What are the objects is DBMS database Access?
9. How to create a table in DBMS Access?
10. Features DBMS queries in Access.
11. What are the main types of queries in DBMS Access?
12. What forms are using in DBMS Access?
13. What are the modes of the form?
14. What are the forms controls?
15. Order the report.

Content module 5

1. The basic rules for creating presentations.
2. Application of the program Microsoft PowerPoint.
3. What kinds of patterns exist in Microsoft PowerPoint?
4. What are the main characteristics of the presentation?
5. What are ways to control the appearance of the slide?
6. What are the modes of display presentations in Microsoft PowerPoint?
7. What are the different ways to view the presentation?
8. What the special effects do can apply to your presentation?

Content module 6

1. Purpose, structure and main features of World Wide Web (WWW).
2. What principles posted information resources in the World Wide Web (WWW)?
3. What is a browser? Its key features and principle of operation.
4. What is the structure of a Web-Paper?
5. Address and Paper of Web-related services.
6. What is the physical format?
7. What is a logical format?
8. What are the table structure in HTML?
9. What are the parameters used to define the type of component tables in language HTML?
10. What kind of set the parameters of the table are in the language HTML?
11. What is hypertext?
12. General features of HTML.
13. What is a tag? Types of tags and their parameters.

14. Types of formats for storing image information.
15. Lists and their types. What are tags define types of lists?
16. Write a list item by means of HTML.
17. What are the ways of placing graphics on the Web page?
18. What do you know logical formatting tags?
19. Units and their design means HTML.

Content module 7

1. The concept of a programming language. Classification of programming languages.
2. What is an algorithm? Its properties. Methods of representation algorithm.
3. The basic structure of the algorithm. Their basic properties.
4. Appointment System Programming "C + +".
5. Concepts of Programming "C + +".
6. Basic elements of programming "C + +".
7. Simple and composite operators in system programming "C + +".
8. A loop with condition in system programming "C + +" (While (condition) do operator end).
9. Organization cycles in systems programming "C + +"
(Repeat operator until (condition)).

Content module 8

1. The concept of a geoinformatics.
2. Geoinformatics Research
3. Geographic information science
4. Geographical information systems
5. Geoinformatics and digital earth initiatives
6. International Cartographic Association
7. International Society for Photogrammetry and Remote Sensing

10. Teaching Methods

In conducting lectures appropriate to use verbal teaching methods: explanation, narration, discussion, educational debate, with a combination of visual learning methods: illustration, showing.

In carrying out laboratory work should be used such as verbal learning method of instruction on the combination of visual learning methods of illustration and demonstration, the aspect of these studies is that they facilitate communication theory and practice, providing students acquiring skills using standard and specialized software, application of information technology to cadastral and form students' initial skills of research activities. Laboratory work in the laboratory are equipped computers.

11. Forms of control

The main methods of control of knowledge and skills students have to study the subject are: oral examination, written and practical test, standardized control in the form of modular test papers, assessment for individual learning task, the final test.

The total value of these methods is to make the best possible to ensure timely and comprehensive feedback between students and teachers, by which establishes how students perceive and learn the material.

The purpose determines the choice of control methods, it should be borne in mind that these methods can be applied in all kinds of control - only complete applications allows regularly and objectively identify the dynamics of the formation of knowledge and skills of students. Each control method has its advantages and disadvantages, scope of application, none of them can not be the only one able to diagnose all aspects of the learning process. So:

- To control the absorption of lectures: oral questioning, written modular test papers, current testing score for an individual learning task, the final test.
- For the monitoring and evaluation of laboratory work: practical test and evaluation of each laboratory work.

12. Ratio between national and ECTS values and rating from the discipline

Student Assessment takes place according to "On the examinations and tests NULES of Ukraine" dated 27/12/2019. The protocol №5 of Table 1

Table 1. The relationship between national ratings and higher education student ratings

National value	Rating, points
EXCELLENT	90-100
GOOD	74-89
SATISFACTORY	60-73
UNSATISFACTORY	0-59

Student's rating of course mastering R_{course} it is determined in points and made 100 points. Course ratings calculate as: $R_{\text{COURSE}} = R_{\text{EDU}} + R_{\text{Final Test}}$ (Course ratings = Education work rating + Final Test Rating)

70% (70 points) of the R_{COURSE} is the R_{EDU}

30% (30 points) of the R_{COURSE} is the $R_{\text{Final Test}}$.

R_{COURSE} equal 100 points (100 %).

Ratings of education work consist of attending a lecture, mastering of theoretical material, executing and passing laboratory works, and control theoretical knowledge.

$$R_{\text{EDU}} = R_{\text{Lect}} + R_{\text{Lab}} + R_{\text{Self}} + R_{\text{Contr.}}$$

Evaluation criteria for an attending of a lecture R_{Lect}

Student will have a **maximal grade** for an attending a lecture, if he/she presents on a lecture, participates actively in the discussion of theme of lecture, answer a lecturer question, gives examples, assiduously conducts the compendium of lecture.

Student will have a **minimum (sufficient) grade (0,6 to maximal)** for a lecture, if he/she is late for the lecture less than 5 minutes, inattentive (but keeps discipline), passive in discussion of theme, doesn't give examples, but can formulate basic concepts of a lecture. Student will have a **0,6 grade**, if he/she didn't appear on a lecture with reasonable excuse, but has conducts the compendium of lecture and can formulate the basic concepts of lecture.

Student will have **grade from 0 to minimum**, if he/she is late for the lecture more than 5 minutes, can't define the basic concepts of lecture, but has the compendium of lecture, inattentive (but keeps discipline).

If student skipped lecture with reasonable excuse and doesn't have the compendium of lecture, student will have **grade equal 0**.

If student skipped lecture without reasonable excuse, disturbs discipline, doesn't have the compendium of lecture, student will have penalty grade.

Evaluation criteria for the mastering control of theoretical materials $R_{\text{Contr.}}$

The written work has a **maximal grade**, if it has written answer to the questions contained in the examination card. Answer should be in the compressed form, logically and consistently, contains a definitions, basic descriptions, principles and receptions of implementation, charts, examples, the indicated application domain in speciality area, etc.

The written work has a **minimal grade (0,6 to maximal)**, if it has main definition and descriptions, indicates principles and receptions of implementation, gives some examples, etc and gives written answer (even inexact) to all questions contained in the examination card.

Rating for laboratory work R_{LAB}

Student will have a **maximal grade** for fulfillment of a laboratory work, if he/she presents on a lesson, participates actively in implementation of laboratory work, executes the task fully and gets the expected result, can explain a logical sequence and phased of actions, answers a control questions of teacher.

Student will have a **minimum (sufficient) grade (0,6 to maximal)** for a laboratory work, if he/she is late for the lesson less than 5 minutes, inattentive (but keeps discipline), executes the task fully, but with some teacher help, and gets the expected result, gives insufficient answer a control questions of teacher.

Student will have **grade from 0 to minimum**, if he/she executes the task partly, (but executes the task more than 75%), or doesn't get the expected result, gives inexact answer.

If student skipped laboratory work with reasonable excuse, student has to rework this lesson in other time. Student should arrange time with a teacher, because task uses license software.

If student skipped laboratory work without reasonable excuse or didn't finish task in the set time, student gets a penalty.

Rating for self-work R_{Self}

Student will have a **maximal grade** for defence of a self-work, if he/she clear define a theoretical grounds of the topic, gives examples, can account for the sequence of actions implementation, can apply theoretical knowledges in practice.

Student will have a **minimum (sufficient) grade (0,5 to maximal)** defence of a self-work, if he/she gives insufficient answer, doesn't give examples or gives one with complication.

Student will have **grade from 0 to minimum** for defence of a self-work, if he/she gives inexact answer, doesn't give main definitions.

Rating of additional work R_{add} and rating of penalty $R_{penalty}$ has an influence on rating of educational work.

Maximal rating of additional work makes 10% from rating of course (that is 10 points). It's determined by a lecturer. Rating of additional work given to student after department decision for implementation of work, that don't foreseen by a working curricula of the course, but increase student's level of skill.

5% (4 points) of the rating of education work is rating of penalty. Rating of penalty has negative quantity and it decreases rating of education work. Rating of penalty was determined by a lecturer. It's entered department decision for a student, who was mastering material of the module too late, wasn't following the executive schedule and had omitted lesson from time to time, etc.

Students have to have more than 60 % points from rating of educational work for admitting to final test. It's meaning, that student should to do next minimal list of work:

- to execute all laboratory works;
- to don't get punitive measure of lecturer.

Rating evaluation of the final test is proposed as a test tasks.

Distribution of value points for performing various learning activities of each module

	Type of work	Module				Course	
		Points per work	Percentage of		Total points	Semester	
			work	module		Per module	Total points
Semester I							
Module # 1	Laboratory work #1	100	15	70	100	25	100
	Laboratory work #2	100	15				
	Laboratory work #3	100	165				
	Laboratory work #4	100	15				
	Self-work № 1	100	10				
	Module test / control	100	30	30			
Module # 2	Laboratory work #5	100	10	70	100	45	
	Laboratory work #6	100	5				
	Laboratory work #7	100	10				
	Laboratory work #8	100	5				
	Laboratory work #9	100	10				
	Laboratory work #10	100	5				
	Laboratory work #11	100	5				
	Laboratory work #12	100	5				
	Laboratory work #13	100	5				
	Laboratory work #14	100	5				
	Laboratory work #15	100	5				
	Module test / control	100	30	30			
Test	100				30		
Semester II							
Module # 3	Laboratory work #1	100	10	70	100	25	100
	Laboratory work #2	100	10				
	Laboratory work #3	100	10				
	Laboratory work #4	100	10				
	Laboratory work #5	100	10				
	Laboratory work #6	100	10				
	Self-work № 1	100	10				
	Module test / control	100	30	30			
Module # 4	Laboratory work #7	100	20	70	100	35	
	Laboratory work #8	100	10				
	Laboratory work #9	100	10				
	Laboratory work #10	100	20				
	Laboratory work #11	100	5				
	Laboratory work #12	100	5				
	Laboratory work #13	100	5				
	Module test / control	100	30	30			

Module	Laboratory work #14	100	35	70	100	10	
	Laboratory work #15	100	35				
	Module test / control	100	30	30			
Exam		100				30	
Semester III							
Module # 6	Laboratory work #1	100	10	70	100	45	
	Laboratory work #2	100	10				
	Laboratory work #3	100	10				
	Laboratory work #4	100	10				
	Laboratory work #5	100	10				
	Laboratory work #6	100	10				
	Module test / control	100	30	30			
Module # 7	Laboratory work #7	100	10	70	100	45	100
	Laboratory work #8	100	10				
	Laboratory work #9	100	10				
	Laboratory work #10	100	10				
	Laboratory work #11	100	10				
	Laboratory work #12	100	10				
	Self-work № 1	100	5				
	Module test / control	100	30	30			
Module # 8	Laboratory work #13	100	30	70	100	10	
	Laboratory work #14	100	20				
	Laboratory work #15	100	20				
	Module test / control	100	30	30			
Exam		100					

13. Methodological Support

1. Конспект лекцій з дисципліни «Геоінформатика». Частина 1 (для студентів напрямку підготовки «Геодезія, картографія та землеустрій») / О.М. Шикула, І.М. Шквир, А.А. Москаленко, Т.А. Гезь. – Київ, 2015. – 241 с.
2. Конспект лекцій з дисципліни «Геоінформатика». Частина II (для студентів напрямку підготовки «Геодезія, картографія та землеустрій») / О.М. Шикула, І.М. Шквир, А.А. Москаленко. – Київ, 2015. – 305 с.
3. Конспект лекцій з дисципліни «Геоінформатика». Частина III (для студентів напрямку підготовки «Геодезія, картографія та землеустрій») / О.М. Шикула, О.П. Дроздівський, І.М. Шквир, А.А. Москаленко. – Київ, 2015. – 162 с.
4. Курс лекцій з дисципліни «Інформатика і програмування» (для студентів напрямку підготовки «Геодезія, картографія та землеустрій» скорочений термін навчання) / О.М. Шикула, І.М. Шквир, А.А. Москаленко, Т.А. Гезь, Н.М. Назаренко. – Київ, 2014. – 128 с.
5. Методичні вказівки до виконання самостійної роботи з дисципліни «Інформатика і програмування» (для студентів напрямку підготовки «Геодезія, картографія та землеустрій» скорочений термін навчання) / О.М. Шикула, І.М. Шквир. – Київ, 2013. – 16 с.

6. Методичні вказівки до виконання самостійної роботи з дисципліни «Інформатика і програмування» (для студентів напрямку підготовки «Геодезія, картографія та землеустрій») / О.М. Шикуча, І.М. Шквир. – Київ, 2013. – 32 с.

14. Recommended literature

Basic

1. Інформатика і комп'ютерна техніка: навчальний посібник для студентів економічних спеціальностей вищих навчальних закладів / М.З.Швиденко, О.М. Ткаченко, О.Г. Глазунова, М.В. Мокрієв, О.Є. Попов, Ю.В. Матус.-К.:»Аграр Медіа Груп»,2011.-460с.
2. Інформаційні системи і структури даних: Навчальний посібник для студентів вищих навчальних закладів.-К.:Вид.дім «Києво-Могилянська академія», 2007.-287с.:іл.-Бібліогр.:с.286-287.
3. Інформатика і комп'ютерна техніка: Навчальний посібник. Видання 2-ге, перероблене, доповнене.-К.:Академвидав,2007.-416с.
4. Світличний О.О., Плотницький С.В. Basics of geoinformatics. Навчальний посібник / Загальна ред. О.О.Світличного. – Суми: Університетська книга, 2005. – 320 с.

Additional

1. Сучасні комп'ютерні технології: Навчальний посібник./ Швиденко М.З., Морзе Н.В., Глазунова О.Г.,Попов О.Є....-К.:»Національний науковий центр «Інститут аграрної економіки», 2007.-с. 705
2. Інформатика Комп'ютерна техніка.Комп'ютерні технології: Підручник для студентів вищих навчальних закладів / за ред. О.І. Пушкаря.-К.:Видавничий центр «Академія»,2002.-704с.
3. Інформатика.Комп'ютерна техніка.омп'ютерні технології: Підручник.-К.:каравела,2003.-464с.
4. Інформатика та комп'ютерна техніка: навчальний посібник / За заг.ред. к.е.н., доц. М.В.Макарової. – Суми:ВТД «Університетська книга», 2003.-642с.
5. Основи комп'ютерної графіки: навчальний посіник / В.С. Березовський, В.О. Потієнко, І.О. Завадський. – 2-видання, доповнено та доопрацьовано.-К.:Вид. Група ВНУ, 2011.-400с.

15. Information Resources

1. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: <http://elearn.nubip.edu.ua/course/view.php?id=705>
2. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: <http://elearn.nubip.edu.ua/course/view.php?id=706>
3. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: <http://elearn.nubip.edu.ua/course/view.php?id=707>
4. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: <http://elearn.nubip.edu.ua/course/view.php?id=708>
5. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: <http://elearn.nubip.edu.ua/course/view.php?id=709>
6. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: http://osvita.ua/school/lessons_summary/informat/list/0/
7. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: <http://shlk-ikt-lg.blogspot.com/>
8. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: <http://www.vingeo.com/Rus/index.html>
9. Електронний навчальний курс[Електронний ресурс]. – Режим доступу: <http://bookwebmaster.narod.ru/cplusplus.html>