

**NATIONAL UNIVERSITY OF LIFE AND ENVIRONMENTAL
SCIENCES OF UKRAINE**

Department of information systems and technologies

«APPROVED»

Dean of economic faculty
Doctor of Economic Sciences,
Professor

_____ Dibrova A. D.
« ____ » _____ 2020

CONSIDERED AND APPROVED
at the meeting of Department of
Information systems and technologies
Protocol № 9 from “22” April 2020
Head of Department
_____ Shvydenko M.Z.

SYLLABUS
**“INFORMATION SYSTEMS AND TECHNOLOGIES IN
ECONOMICS”**

Area of knowledge 07 "Management and Administration"

Specialty 071 "Accounting and Taxation"

Faculty of Information technology

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1. Description of the course “Information systems and technologies in economics”

Area of knowledge, direction of preparation, specialty, educational and qualification level		
Area of knowledge	07 "Management and Administration"	
Specialty	Specialty 071 "Accounting and Taxation"	
Educational and qualification level	bachelor	
Characteristics of the course		
View	normative	
Total number of hours	90 hrs.	
Number of credits ECTS	3	
Number semantic modules	2	
Course project (work) (if available in curriculum)	-	
Form of control	Exam	
Descriptions of the course for full-time and distance learning		
	full-time education	correspondence form of training
Year of preparation	1	-
Semester	1	-
Lectures		-
Practical works	-	-
Laboratory classes	75 hrs.	-
Independent work	15 hrs.	-
Individual tasks	-	-
Total	90 hrs.	
Number of weekly hours for full-time students: classroom	5 hrs.	

2. Goals and objectives of the course

The purpose of the course «Information systems and technologies in economics» is to obtain future accountants the appropriate level of professional theoretical knowledge, the formation and development of special skills and practical skills in information technology, as well as the use of information and communication technologies with the goal for successful information activities in economic field according to the specialty.

The task is to study the theoretical basics of computer science and acquire skills in the use of applied systems of economic data processing in the study of socio-economic systems and solving problems of professional orientation.

The knowledge and practical experience gained during the course will significantly expand students' opportunities in mastering a set of special disciplines: statistics, mathematical modeling of economic systems, computer programming, databases in management systems, information systems in accounting, etc.

As a result of studying this course, the student should know:

- the basic concepts and terminology of the course, rules and algorithms of data processing by means of various software, general principles of construction of modern information technologies and systems;
- basic composition and organization of interaction of typical modern information technologies used in professional activity, modern tendencies and trends in the field of hardware and software of office activity;
- structure and purpose of modern information technology software;
- general concepts and principles of effective information retrieval;
- principles of work with the main services of the Internet and ways to use them in professional activities;
- general concepts and principles of effective information retrieval;
- the role of information technologies and information systems in the economic sphere, methods of using universal and specialized information technologies and systems;
- basic concepts of data storage, security and protection, information technologies and systems.

Be able to: build an information model of the subject area, use ICT for data processing and organization of teamwork for their creation and reuse; to analyze information related to a particular subject area using modern office computer programs; determine rational methods and ways of using application software to solve problems in the specialty; apply basic techniques of information and information-analytical work with the use of computer technology in professional activities.

The course provides the formation of a number of general and special (professional, subject) competencies:

General Competences (GC)

GC 1. Ability to learn and be ready to learn and apply the acquired knowledge.

GC 3. Ability to work independently and in a team, taking into account the requirements

GC 6. Ability to be critical and self-critical.

GC 7. Ability to think flexibly and competently apply the acquired knowledge in professional activities.

GC 8. Ability to communicate in state and foreign languages both orally and in writing.

GC 9. Skills in the use of modern information and communication technologies.

GC 11. Ability to present the results of research.

Special (professional) competencies (PC)

PC 7. Ability to implement accounting procedures using specialized information systems and computer technology.

PC 8. Ability to apply and form information support for enterprise management using modern technical and methodological tools.

Program results

PR2. Know the place and importance of accounting, analytical, control, tax and statistical systems in the information support of users of accounting and analytical information in solving problems in the field of social, economic and environmental responsibility of enterprises, institutions and organizations.

PR 4. To form and analyze the financial, administrative, tax and statistical reporting of enterprises, institutions, organizations and interpret the information obtained for management decisions.

PR 11. Use specialized information systems and computer technologies for accounting, analysis, audit and taxation.

Final form of control of the course: Exam.

3. The program of the course

Module 1. Theoretical basics of economic informatics

Topic 1. Theoretical basis of economic informatics.

Classification of economic information. The concept of computer science, information and data. Information, its types and quantitative measurement. Data, their types and structure. Data carriers. The main directions of computer science development. The importance of computer technology in improving the efficiency of the accountant.

The hardware structure of a modern computer. Composition, purpose, interaction and characteristics of basic devices (processor, memory, external devices). Structural and functional scheme of the PC. Modern PC hardware market.

The structure of modern computer software. Composition, purpose, and main functions. System software. Tool software (programming systems). Application software. Modern PC software market.

Working with PC software for the economic sphere. Determining the necessary software for the future accountant. Distribution of programs by categories. Implementation of the description of programs in accordance with the functional purpose.

Features of work in the Internet. Search for information on the Internet. Search rules. Keywords. Selection of search results by relevance. Familiarity with online systems for finding economic and legal information.

Network office. Working with Google Apps. Familiarity with the principles of the network office. Overview of the types and features of Google Apps. Create and co-edit Google Docs and learn how to work with a shared calendar.

Topic 2. Basics of working with business documentation.

Working with text documents in MS Word. Creating a text document. Text document formats. Enter, save and download documents. Text formatting. Display unprinted characters. Character formatting: font setting; Formatting toolbar; insertion of non-standard and special symbols; initial letter. Paragraph formatting: creation of lists; insertion of mathematical formulas and symbols; converting text to a table.

Working with non-text objects in MS Word. Working with tables. Creating and deleting tables. Editing a table. Formatting tables. Calculations in the table. Creating formulas. Editing formulas. Placement of formulas in the text. Tables and charts in MS Word. Insert charts and graphs into a document. Editing charts. Types of diagrams. Insert pictures. Placing pictures in the text. Picture formatting. Drawing of graphic constructions by means of MS Word, work in the WordArt program. Import graphic objects. Creating an organizational chart. Editing an organizational chart.

Working with the structure of a text document. Document templates. Using styles and elements of auto text in text documents. Structuring the finished text by

sections and subsections. Formatting structured documents. Page numbering. Formation of automatic content.

Topic 3. Visualization of information and basics of working with computer graphics.

Basic rules of working with the presentation. Basics of working with data presentation technology. Creation of illustrative material by means of desktop publishing systems and development of an animated video with the help of MS PowerPoint. Review and use online designers for presentations.

Creating illustrative material for printing. Overview of types of advertising illustrative materials and programs for their creation. Creating an illustrative booklet by means of desktop publishing systems, on the example of MS Publisher. Study of features of development of illustrative material to scientific information.

Basic principles of working with raster graphics. Techniques for creating and editing illustrative material by means of graphic editors (for example, Photoshop online). Possibilities and rules of work with layers (layers). Overview of image editing and color replacement tools.

Topic 4. Basic concepts and role of information systems in management.

Information systems: characteristics, stages of development. Classification and structure of information systems. Automated ICs in financial and banking institutions. Principles of creation and functioning of IP in financial and credit institutions. Means of creating and providing automated information technologies at enterprises.

Module 2. Processing and analysis of economic information in MS Excel

Topic 5. Presentation and visualization of economic information in MS Excel.

Data entry. Introduction of formulas. Select of cells, ranges of cells, rows, or columns. Enter sequences of numbers, dates and text. Using AutoFill. Cell formatting: number formatting, alignment, border creation and background fill.

Working with simple formulas. Creating a formula. Mathematical operators. Absolute and relative addressing. Introduction to the formulas of dates and times. Errors in formulas. Replacing the formula with its calculated value. Using built-in functions. Linking of formulas.

Data visualization. Structural elements of diagrams. Creating and customizing charts. Construction of diagrams of different types. Stages of creating diagrams. Creating a basic (embedded) chart. Improving the base chart. Examples of visualization of economic processes using business graphics.

Excel toolbars. Moving to worksheet. Data entry. Introduction of formulas. Allocate cells, cell ranges, rows, or columns. Entering sequences of numbers,

dates and text. Using AutoFill. Format cells: number format, alignment, frame creation and background fill.

Topic 6. Using spreadsheet functions for data analysis.

Familiarity with the ability to perform calculations using MS Excel functions for business analysis. IF function and its application. Functions AND, OR and NOT and their application. Calculating the values of logical functions with many conditions. Use of logical functions when their value is textual for certain conditions.

Problems on simple and complex interest. Calculations of financial functions. Functions COUNTIF and SUMIF and their application. Implementation of extensive computational processes in Microsoft Excel.

Topic 7. Organization of databases in MS Excel.

Organization of the database. Create lists. Data entry. Search records. Arranging records. Using Auto Filter. Using AutoFormat. Advanced filter. Functions for working with databases.

Generation of consolidated tables. Data consolidation. Interim Results. Automate the execution of procedures in MS Excel by creating macros and applying a package of analysis for financial and scientific data.

3. The structure of the discipline «Information systems and technologies in economics»

Names of content modules and topics	Number of hours												
	Full- time							Part-time education					
	weeks	Total	including					Total	including				
			L	P	Lab	Ind	Indep		L	P	Lab	Ind	Indep
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Content module 1 Theoretical basics of economic informatics													
Topic 1. Theoretical basis of economic informatics	1,2	12			10		2						
Topic 2. Basics of working with business documentation	3,4	12			10		2						
Topic 3. Visualization of information and basics of working with computer graphics	5-7	12			10		2						
Topic 4. Basic concepts and role of information systems in management	8	7			6		1						
Module 1		2			2								
Total for semantic module 1		45			38		7						
Content module 2. Processing and analysis of economic information in MS Excel													
Topic 5. Presentation and visualization of economic information in MS Excel	8,9	14			10		4						
Topic 6. Using spreadsheet functions for data analysis	10-12	16			14		2						
Topic 7. Organization of databases in MS Excel	13-15	14			12		2						
Module 2		1			1								
Total for semantic module 2		45			37		8						
Course total		90			75		15						

4. Topics of seminars

Do not stipulated by the curriculum.

5. Themes of laboratory classes

№ з/п	Name of theme	Amount of hours
1.	Hardware of the modern PC	2
2.	Software of the modern PC	4
3.	Network office. Working with Google Apps.	2
4.	Formatting a document. Working with tables	4
5.	Basics of working with text documents. Creating Formulas. Graphs and charts in MS Word	4
6.	Work with charts and drawings in MS Word	2
7.	Automatic formatting of large documents. Structure of the document. Links.	4
8.	Create a presentation of scientific work in MS PowerPoint.	4
9.	Creation of advertising and illustrative material for printing by means of MS Publisher	2
10.	Basics of bitmap graphics in Photoshop	4
11.	Search and classification of economic information systems	4
12.	Use of ERP-systems for online business	2
13.	Module 1	2
	Total for 1 module	38
1.	Creating and formatting tables in MS Excel spreadsheet	2
2.	Construction of complex charts and diagrams	4
3.	AutoFill and Auto Summing.	2
4.	Work with different books and sheets in MS Excel	4
5.	Logical features of the MS Excel spreadsheet	4
6.	Financial features of the MS Excel spreadsheet	4
7.	Data rows and Pivot tables in MS Excel spreadsheet	4
8.	Add-on "Data Analysis" and the "Solver" tool. Macros.	4
9.	Creating macros and toolbars	4
10.	Creation of VBA functions	3
11.	Module 2	2
	Total for 2 module	37
	Total of the course	75

6. Topics of practical classes

Do not stipulated by the curriculum.

7. Control questions tests for determining the level learning of knowledge students

1. What is information? How to measure information?
2. What is included in the central equipment of the PC?
3. What devices are peripherals?
4. What is random access memory? What is permanent memory?
5. What types of printers do you know?
6. What is an operating system? What programs are called drivers?
7. How many ways you can save a document?
8. How you can insert a column break?
9. What is the shortcut keys for creating hyperlink?
10. How to delete a break in column?
11. How you can take a screen shot in word?
12. How to create a Macro in word?
13. How you can customize the indent amount?
14. What is the short cut to move the insertion point to the beginning of the document?
15. What is the correct procedure for creating a hanging indent?
16. What is the easiest way to save a chart so you can use it another document?
17. What you can add to label the values of individual chart elements?
18. How you can connect with cloud service on word?
19. How you can insert video in Microsoft Word?
20. What is Microsoft Excel? What is Ribbon?
21. Explain Spreadsheet and its Basics. How can you add a new Excel worksheet?
22. Explain workbook protection types in Microsoft Excel.
23. How many data formats are available in Microsoft Excel? Name some of them.
24. How can you wrap the text within a cell?
25. Explain Macro in Microsoft Excel.
26. Difference between COUNT, COUNTA, COUNTIF and COUNTBLANK in Microsoft Excel.
27. What is IF function in Microsoft Excel? Can we create shortcuts to Excel functions?
28. How we can change the cell formatting?
29. What is conditional formatting and how to use it?
30. How to make drop down list?
31. How can we determine the day of the week for a particular date? How to use advanced filter?
32. What is Pivot Table and why we use it? Why do we use it? What is Nested IF function? What is Count IF function and how to use it?
33. What is chart and how can we use it?
34. What is the quick way to return to a particular area of a worksheet?
35. What is the "What IF" condition in Excel formulas?

National University of Life and Environmental Sciences of Ukraine			
Educational qualification level Bachelor	Department of Information systems and technologies 20__ – 20__	Examination ticket № 1 by discipline Information systems and technologies in economics	Approved Head of the department <hr/> <hr/> M. Shvydenko
Test questions			
Question 1. Which of the following is an example of Binary?			
a. 123; b. 7B; c. 111 1011; d. All of the above.			
Question 2. Choose true matches. Binary numbers are on the right.			
a. 17_{10} 10000 b. 16_{10} 1111 c. 15_{10} 10001			
Question 3. Choose true expression for fraction			
a. $=1+A2-2/1+A3/2*A1$; b. $=1+(A2-2)/(1+A3/(2*A1))$; c. $=1+(A2-2)/1+A3/(2*A1)$; d. $=1+(A2-2)/(1+A3/2*A1)$.			
Question 4. Which one is a STORAGE device?			
a. CPU; b. Printer; c. CD; d. Floppy Disk; e. Headphones.			
Question 5. How can you highlight text without using the mouse?			
a. Use the F6 key; b. Use the arrow keys while holding down a Ctrl key; c. Use the arrow keys while holding down a Shift key; d. It is impossible.			
Question 6. How we can select few different areas on the sheet?			
a. holding CTRL key; b. using Edit menu; c. just using mouse; d. holding ALT key.			
Question 7. What a difference between 0,03 and 3%?			
a. there is no difference; b. different values; c. different formats; d. different data types.			
Question 8. Choose a system software			
a. Office tools; b. Development system; c. Antiviruses; d. Hardware diagnostic tools; e. Drivers.			

Question 9. What sell intervals we need to build the chart?

	A	B	C	D	E	F	G	H	I
2									
3			Виручка від продажу, тис. грн.						
4		№	Товар	1 кв.	2 кв.	3 кв.	4 кв.	За рік	Структура
5	1	Пшениця	150	175	160	168	653	36,60%	
6	2	Горох	38	42	40	29	149	8,35%	
7	3	Кукурудза	70	81	76	75	302	16,93%	
8	4	Картопля	99	95	100	110	404	22,65%	
9	5	Буряк	75	70	65	66	276	15,47%	
10		Всього	432	463	441	448	1784	100,00%	
11									
12									

- a. C5:C9 and H5:H9;
- b. H5:H9 and I5:I9;
- c. C5:C9 and I5:I9;
- d. C4:I4 and C9:I9.

Question 10. What type of address \$5\$F?

- a. mixed;
- b. relative;
- c. it is not correct cell address;
- d. absolute.

Exam Questions

Open question (5 points)

What is an operating system? (Give examples and describe them).

Practical task "Calculations in MS EXCEL" (10 points)

Using EXCEL and using sales data (file provided by the teacher), calculate the salaries of managers, payroll taxes and bonus for the maximum amount of the agreement for January 2015.

You work at the company "X", which sells food products.

The salary to managers is calculated according to the rule

guaranteed 2500 UAH + percentage of the amount of the concluded agreement, at which:

- for the sale of confectionery goods (cookies or wafers or crackers), the manager owns 10% of the amount of the transaction,
- for the sale of cereals - 20% of the transaction amount;
- for sale of canned food or fish - 30% of the transaction amount.

Progress of the work:

1. Copy the source data from Sheet 1 to Sheet2 and calculate the amount for the transaction.
2. In Sheet 2, calculate % of the manager from the transaction amount (logical function IF).

	A	B	C	D	E	F	G	H	I
1		Дата	Менеджер	Продукт	Ціна	Кількість	Сума угоди	% менеджера від суми угоди	
2	1	01.01.2015	Коваленко	Вафлі	10,20	78	795,60	159,12	
3	2	01.01.2015	Бондаренко	Консерви	35,65	35	1247,75	374,33	
4	3	01.01.2015	Ткаченко	Крекер	7,80	89	694,20	138,84	
5	4	01.01.2015	Мельник	Крупи	25,65	149	3821,85	764,37	

- In Sheet 3, calculate the total% of managers from the transaction amount for JANUARY 2015 (Pivot Table).

2			
3	Позначки рядків	Сума з % менеджера від суми угоди	
4	янів	49053,256	
5	Бойко	6554,785	
6	Бондаренко	8811,935	
7	Іванов	7040,414	
8	Коваленко	10432,575	
9	Мельник	8519,558	
10	Ткаченко	7693,989	

- In Sheet 3, calculate the salaries of managers for JANUARY 2015 and pay withholding (employees were not sick and have no social benefits).

A	B	C	D	E	F	G	H	I	J	K
1	Менеджер	Сума зароблених %	Сума зарплати	Єдиний соціальний внесок	Податок на доходи фізичних осіб	Військовий збір	Сума утримань	Аванс	Премія за максимальну суму угоди	До виплати
2	Бойко	Переносимо з зведеної таблиці	S=Сума зароблених % +2500	=S *3,6%	- якщо S<=12180, то прибутковий податок = S * 96,4% *15% - якщо S>12180, то прибутковий податок = 12180 * 96,4% *15%+(S-12180) * 96,4% *20%	=S *1,5%	=Єдиний соціальний внесок + Податок на доходи фізичних осіб + Військовий збір	Всім по 2500	1000 грн. отримує тільки той, хто в місяць вашого варіанту мав максимальну суму угоди	= S - Сума утримань - Аванс + Премія
3	Бондаренко									
4	Іванов									
5	Коваленко									
6	Мельник									
7	Ткаченко									
8	Всього									
9										

- With the help of database functions, find the manager who entered into an agreement for the maximum amount in January and give him a prize of UAH 1,000.
- Make calculations in accordance with the sample.

A	B	C	D	E	F	G	H	I	J	K	L
1	Менеджер	Сума зароблених %	Сума зарплати	Єдиний соціальний внесок	Податок на доходи фізичних осіб	Військовий збір	Сума утримань	Аванс	Премія за максимальну суму угоди	До виплати	
2	Бойко	6554,79	9054,79	325,97	1309,32	135,82	1771,12	2500,00		4783,67	
3	Бондаренко	8811,94	11311,94	407,23	1635,71	169,68	2212,61	2500,00		6599,32	
4	Іванов	7040,41	9540,41	343,45	1379,54	143,11	1866,10	2500,00		5174,31	
5	Коваленко	10432,58	12932,58	465,57	2015,15	193,99	2674,71	2500,00		7757,87	
6	Мельник	8519,56	11019,56	396,70	1593,43	165,29	2155,43	2500,00	1000,00	6364,13	
7	Ткаченко	7693,99	10193,99	366,98	1474,05	152,91	1993,94	2500,00		5700,04	
8	Всього	49053,26	64053,26	2305,92	9407,20	960,80	12673,91	15000,00	1000,00	36379,34	
9											

Practical task " Create a presentation in MS Power Point " (5 points)

Create a presentation in MS Power Point, using a file with a preliminary task. For each worksheet in MS Office Excel file, create a separate slide. Make a presentation and add slide animations and animation of transitions.

8. Teaching methods

Learning of the material provided at lectures, laboratory classes and individual works in computer classes equipped local area networks, the Internet and the latest software. Lectures involving the use of presentations, educational films and multimedia equipment to facilitate the assimilation of the material.

9. Forms of control

Control of knowledge for students of «Informatics» provides the following control measures:

- *Self-control* – is the primary form of knowledge control that necessarily provided by distance learning courses through the provision for students with a list of questions (questions and answers);
- *Current control* – implements through direct teacher evaluation system of laboratory practical workshops and assignments for independent work;
- *Modular control* – carried out remotely in automatically or ocular mode, the basic form of it is testing;
- *Final control* – an exam which has to be passed by ocular mode during the appointed by Dean Office or individual schedule according to approved training plan.

10. Description of institutional grading system.

Evaluation of the student is realized according to the provisions «About the examinations and tests of NULES of Ukraine» dated by 27.20.2019. The protocol number 7 according to the table. 1.

National Grade	Rating of student, scores
Excellent	90 – 100
Good	74 – 89
Pass	60 – 73
Fail	0 – 59

For determination of the rating of the student (listener) from mastering to the discipline R_{course} (100 points) obtained ranking in certification (30 points) added to the rating of student (listener) for Academic work R_{ed} (70 points):

$$R_{course} = R_{ed} + R_{at}$$

11. Methodical maintenance

1. Soroka P.M., Kharchenko V.V. Information systems in management. Practical work Educational book K.: ЦП «Компрінт», 2012. – 145 p.
2. Kharchenko V.V., Kasatkina O.M. Structure of the personal computer and basics of operating systems Methodical manual for the students of computer science and economic cybernetics and economic specialties – K.: ЦП «КОМПРИНТ», 2014 – 135 с.
3. Kharchenko V.V., Kasatkina O.M. Modern information systems and technologies / Methodical manual for the students of computer science and economic cybernetics and economic specialties – K.: ЦП «Компрінт», 2014 – p. 121.

12. Recommended Literature

Main sources:

1. Касаткін Д.Ю., Глазунова О.Г., Блозва А.І., Касаткіна О.М. «Практикум з інформатики». Навчальний посібник (2 видання) – К.: ЦП «Компрінт», 2017. – 382 с.
2. Сорока П.М. Харченко В.В. Харченко Г.А. Інформаційні системи і технології в управлінні організацією К.: «Компрінт», 2019. – 518 с.
3. Сорока П.М. Харченко В.В. Практикум з інформаційних систем в управлінні організацією – К.: ЦП «Компрінт» 2017 р. – 378 с.

Auxiliary sources:

1. Касаткін Д.Ю., Блозва А.І., Касаткіна О.М. «Інформатика і системологія» Підручник. – К.: ЦП «Компрінт», 2017. – 421 с.
2. Швиденко М.З. «Інформатика та комп'ютерна техніка» Підручник. [для студ. екон. спец. вищих навч. закладів] – К.: Інтерсервіс, 2014. – 647 с.
3. Садко М.Г., Сорока П.М. Навчально-методичний посібник «Бази даних та системи управління базами даних». – К.: НУБіП, 2014. – 120 с.

13. Information Resources

1. Курс лекцій з дисципліни "Основи інформаційних технологій" [Електронний ресурс] – Джерело: <http://www.informatuka.info/index.php>
2. Дистанційні курси "Word та Excel: інструменти і лайфхаки" на платформі Prometheus [Електронний ресурс] – Джерело: https://edx.prometheus.org.ua/courses/course-v1:DNU+PRIN-101+2017_T1/about
3. Дистанційні курси "Цифрові комунікації в глобальному просторі" на платформі Prometheus [Електронний ресурс] – Джерело: https://courses.prometheus.org.ua/courses/course-v1:Prometheus+ITArts101+2017_T1/about
4. Планета Excel [Електронний ресурс] – Джерело: <http://www.planetaexcel.ru/>