

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

Department of information systems and technologies

**«APPROVED»**

Dean of the faculty of agrarian  
management

PhD of Economic Sciences,  
Associate professor

\_\_\_\_\_ Ostapchuk A.D.  
« \_\_\_\_ » \_\_\_\_\_ 2021

**«CONFIRMED»**

at the meeting of department of  
Information systems and technologies

Protocol № 9 from “13” 04 2021

Head of department

\_\_\_\_\_ Shvydenko M.Z.

**«CONSIDERED»**

Guarantor of the EP «Management»

Guarantor of the EP

\_\_\_\_\_ Mostenska T.L.

**SYLLABUS**

of the course

**“ECONOMIC INFORMATICS”**

Area of knowledge 07 – «Management and Administration»

Specialty 073 – «Management»

Faculty of Information technology

Authors: PhD of Economics Kharchenko V.V.

Kyiv – 2021

## 1. Description of the course

### “Economic Informatics”

<b>Area of knowledge, direction of preparation, specialty, educational and qualification level</b>		
Area of knowledge	07 «Management and administration»	
Specialty	073 «Management»	
Educational and qualification level	bachelor	
<b>Characteristics of the course</b>		
View	<i>normative</i>	
Total number of hours	<i>120</i>	
Number of credits ECTS	<i>4</i>	
Number semantic modules	<i>4</i>	
Course project (work) (if available in curriculum)	<i>-</i>	
Form of control	<i>Exam</i>	
<b>Descriptions of the course for full-time and distance learning</b>		
	full-time education	correspondence form of training
Year of preparation	<i>1</i>	
Semester	<i>1</i>	
Lectures	<i>15 hrs.</i>	
Practical works	<i>-</i>	
Laboratory classes	<i>45 hrs.</i>	
Independent work	<i>60 hrs.</i>	
Individual tasks	<i>-</i>	
Number of weekly hours for full-time students: classroom	<i>4 hrs.</i>	

## 2. Goals and objectives of the course

The course "Economic Informatics" highlights the main principles and methods of applying modern information technologies in solving economic problems. The purpose of the course is to form in future professionals the necessary level of information and computer culture, the acquisition of practical skills in PC and the use of modern information technology to solve various problems in the process of learning and working in the specialty. The acquired skills of working on a personal computer with an operating system and major software packages such as MS Word, MS Power Point, MS Excel and online systems will enhance the performance of the tasks by future specialists.

**Course goal** – to get theoretical and practice knowledge of modern information technology, which will give the opportunity to work on a personal computer, rapidly and properly solve the problem for future profile specialty.

The basic subjects of the course are followings:

- theoretical basics of functioning of the computers;
- structure and specifications of main hardware parts of the information system;
- types of software;
- basics of networks technology and telecommunication;
- work with operating system;
- work with service software and utilities;
- work with text documents and presentations.
- work with spreadsheets;

Successful of finishing the course will be base for learn following courses that touched to information processing and work with information systems.

**The main objectives of the course:** learning theoretical basics of information systems and forming skills in working with operating system, service programs, text processing, creating digital presentations and spreadsheet.

**At the finishing students have to know:**

- theoretical fundamentals of computer science and operational characteristics of computer technology and modern information systems;
- main features and capabilities of the MS Windows operating system;
- main features and features of the word processor MS Word;
- main features and features of the MS Excel spreadsheet;
- mechanisms for the search and protection of information on the Internet;
- theoretical foundations of data banks and databases, information systems;
- peculiarities of solving managerial tasks taking into account the current practice of managers.

**Ability and skills at the end of study of course:**

- have basic skills on the PC: MS Windows operating system, MS Word processor, MS Excel spreadsheet;
- to carry out the analysis of economic information, to have skills in work with systems of processing of economic information;
- apply office automation technologies to solve economic and managerial tasks;
- own Internet search engines and use programs for communication over the Internet;
- use information resources of the World Wide Web in management activities;
- work on a personal computer, quickly and qualitatively solving tasks on profile of the future specialty;

**The course provides the formation of a number of general competencies:***General Competences (GC)*

GC 8 Skills in the use of information and communication technologies.

GC 10. Ability to conduct research at the appropriate level.

*Program Competences (PC)*

PR 21. Demonstrate the ability to use information and communication technologies to search, process, analysis and use of information from various sources.

Final form of control of the discipline: Exam.

### **3. The program of the course**

#### **Module 1. Theoretical basis of economic informatics**

##### **Topic 1. Theoretical basis of economic informatics**

Determine of information and computer science, information technology (IT) and information system (IS). The role and place of IT in human life. Stages of development of IT. Industry and market IT. The latest trends in IT. Information, its types and quantitative dimension. Classification of economic information. Data, their types and structure. Data carriers. Main directions of computer science development. The value of computer technology in improving the efficiency of the agroindustrial complex of Ukraine.

##### **Topic 2. Basic characteristics of hardware and software**

Hardware PC. Theoretical foundations and hardware of a personal computer. Systems for calculating and encoding information. Computer devices: processor, memory, monitor, keyboard. Media carriers (floppy disks, CDs, hard disks, flash memory). Specifications (PCs and components).

Windows Setup and Data Management. Configuring the operating system and data management skills in the Windows environment. Data management (Windows-Explorer file manager): create, move, delete directories; create, move, delete files. Compress and save files.

Network office. Working with Google Apps. Introduction to the principles of the work of the network office. Overview of Google Apps Types and Features. Create and collaborate on editing Google documents and acquiring hands-on collaborative calendar skills.

##### **Topic 3. Formats of electronic documents**

Basic rules for working with the presentation. Basics of working with data presentation technology. Creating illustrative material with desktop publishing tools and developing an animation movie using 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. Create an illustrative booklet with desktop publishing tools, as an example for MS Publisher. Study of the features of the development of illustrative material for scientific information.

Basic principles of work with raster graphics. Tricks for creating and editing illustrative material using graphic editors (for example, Photoshop online). Opportunities and rules for working with layers (layers). Overview of image editing tools and color replacements.

##### **Topic 4. Basics of working with text documents in MS Word**

The structure of the window. Creating a text document. Word window elements: document title bar, main menu bar, toolbar, ruler, document view bar. Input, save and download documents. Typing Moving through the text. Removing

text. Document viewer modes. Highlight text. Insert and replace text. Copy and move text. Clipboard. Saving documents. Upload documents. Create new documents. Formatting text. Unmarked characters are displayed. Formatting characters: font setting; Formatting toolbar; insert non-standard and special characters; initial letter Formatting paragraphs: creating lists-lists; insert mathematical formulas and symbols; converting text to a spreadsheet.

Work with non-tangible objects in MS Word. Working with tables. Create and remove tables. Edit the table. Formatting tables. Calculations in the table. Creating Formulas. Editing formulas. Placement of formulas in the text. Tables and charts in MS Word. Insert chart and graph documents. Editing charts. Types of charts. Insert pictures. Placing drawings in the text. Formatting drawings. Drawing graphic constructions by means of MS Word, work in the program WordArt. Import graphic objects. Create an organizational chart. Edit organizational chart.

Using styles and auto text elements in text documents. Formatting structured documents and working with non-text objects. Structuring the finished text by sections and subdivisions. Numbering of pages. Formation of automatic content. Work in a document with references to literature.

## **Module 2. Introduction to spreadsheet MS Excel**

### **Topic 5. Introduction to spreadsheet MS Excel**

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.

Creating a formula. Mathematical operators. Absolute and relative addressing. Enter the date and time formula. Errors in formulas. Replacing the formula with its calculated value. Use of the built-in functions Formula Connection. Copy formulas. The construction of graphs from one variable  $y = f(x)$  and from two variables  $z = f(x, y)$ . Calculation of  $n!$  using the relative addressing of the cells and the corresponding function embedded in Excel.

### **Topic 6. Functions of spreadsheet MS Excel**

Calculation of values of logic functions with two and three conditions. Use logical functions when their values are text based on certain conditions. Calculation of values of logic functions with four and more conditions.

Tasks for simple and complex interest. Taking inflation into account when interest is calculated. Create charts. Chart Wizard. Toolbar. Worksheets with charts. Chart Elements. Allocation of diagrams. Editing charts. Legend. Text in charts. Grid lines. Axis Bulk charts. Creating graphs on two axes and charts with refinement and summation.

## **Topic 7. «Data Analysis», «Pivot tables» and «Solver» tools 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.

Basic theoretical concepts and terms of Pivot tables in MS Excel. Definition of terms. The main features of the Pivot tables in MS Excel. Objects of the Pivot tables. Create a new Pivot tables in MS Excel. Working with the Pivot tables in MS Excel. Enter, edit and process data. Ways to create Pivot tables.

### 3. Structure of the course “Economic Informatics”

Names of semantic modules and themes	Amount of hours											
	Daily form						Correspondence form					
	total	including					total	including				
		l	p	lab	ind	i.w.		l	p	lab	ind	i.w.
1	2	3	4	5	6	7	8	9	10	11	12	13
<b>Semantic module 1. Theoretical basis of economic informatics</b>												
Topic 1. Theoretical basis of economic informatics	18	2		6		10						
Topic 2. Basic characteristics of hardware and software	20	2		4		10						
Topic 3. Formats of electronic documents	13	2		6		5						
Topic 4. Basics of working with text documents in MS Word	7	2		4		5						
Module 1	2			2								
Total for semantic module 1	60	8		22		30						
<b>Semantic module 2. Introduction to MS Excel</b>												
Topic 5. Introduction to MS Excel	20	2		6		10						
Topic 6. Functions of MS Excel	20	2		8		10						
Topic 7. «Data Analysis», «Pivot tables» and «Solver» tools in MS Excel	18	3		7		10						
Module 2	2			2								
Total for semantic module 2	60	7		23		30						
<b>Total, hrs</b>	120	15		45		60						

### 4. Topics of seminars

are not provided the curriculum



## 5. Topics of practical lessons

are not provided the curriculum

## 6. Topics of laboratory lessons

№ з/п	Name of theme	Amount of hours
1.	Hardware of the modern PC	2
2.	Software of the modern PC	2
3.	Network office. Working with Google Apps.	2
4.	Formatting a document. Working with tables	2
5.	Basics of working with text documents. Creating Formulas. Graphs and charts in MS Word	2
6.	Work with charts and drawings in MS Word	2
7.	Automatic formatting of large documents. Structure of the document. Link.	2
8.	Create a presentation of scientific work in MS PowerPoint.	2
9.	Creation of advertising and illustrative material for printing by means of MS Publisher	2
10.	Basics of bitmap graphics.	2
11.	Module 1	2
	<b>Total for 1 module</b>	<b>22</b>
1.	Create and format tables in MS Excel	2
2.	Construction of complex charts and diagrams	2
3.	AutoFill and Auto Summing	2
4.	Work with different books and sheets in MS Excel	2
5.	Logical features of the Excel spreadsheet	2
6.	Financial features of the Excel spreadsheet	2
7.	Data rows in MS Excel	2
8.	Pivot tables in MS Excel	2
9.	Add-on "Data Analysis" and the "Solver" tool in MS Excel	2
10.	Macros in MS Excel	3
11.	Module 2	2
	<b>Total for 2 module</b>	<b>23</b>
	<b>Total of the course</b>	<b>45</b>

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

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 Economic Informatics	Approved Head of the department  M. Shvydenko  ____.____.____
<i>Test questions</i>			
<b>Question 1. Which of the following is an example of Binary?</b>			
a. 123; b. 7B; c. 111 1011; d. All of the above.			
<b>Question 2. Choose true matches. Binary numbers are on the right.</b>			
a. $17_{10}$ 10000 b. $16_{10}$ 1111 c. $15_{10}$ 10001			
<b>Question 3. Choose true expression for fraction</b>			
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. $=1+(A2-2)/(1+A3/2*A1)$ .			
<b>Question 4. Which one is a STORAGE device?</b>			
a. CPU; b. Printer; c. CD; d. Floppy Disk; e. Headphones.			
<b>Question 5. How can you highlight text without using the mouse?</b>			
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.			
<b>Question 6. Choose a system software</b>			
a. Office tools; b. Development system; c. Antiviruses; d. Hardware diagnostic tools; e. Drivers.			
<b>Question 7. What sell intervals we need to build the chart?</b>			

№	Товар	1 кв.	2 кв.	3 кв.	4 кв.	За рік	Структура
1	Пшениця	150	175	160	168	653	36,60%
2	Горох	38	42	40	29	149	8,35%
3	Кукурудза	70	81	76	75	302	16,93%
4	Картопля	99	95	100	110	404	22,65%
5	Буряк	75	70	65	66	276	15,47%
<b>Всього</b>		<b>432</b>	<b>463</b>	<b>441</b>	<b>448</b>	<b>1784</b>	<b>100,00%</b>



- C5:C9 and H5:H9;
- H5:H9 and I5:I9;
- C5:C9 and I5:I9;
- C4:I4 and C9:I9.

**Question 8. How we can select few different areas on the sheet?**

- holding CTRL key;
- using Edit menu;
- just using mouse;
- holding ALT key.

**Question 9. What a difference between 0,03 and 3%?**

- there is no difference;
- different values;
- different formats;
- different data types.

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

- mixed;
- relative;
- it is not correct cell address;
- 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:

- 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	

1. 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

2. 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									

3. 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.

4. 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	

### Practical task "MS WORD" (5 points)

Using MS Word to create a document as shown below. The value 77980,76 of the column Amount earned% must be calculated using tool MS Word

«Manager's salary report for  
JANUARY (month of your variant) for 2018 year»

Manager	Amount earned%	Amount of salary	Single social contribution	Income tax	Military tax	Amount of deductions	Advance	Award for the maximum transaction amount	To pay
Boiko	13661,45	16161,45	581,81	2528,85	242,42	3353,09	2500,00		10308,37
Bondarenko	12281,40	14781,40	532,13	2262,78	221,72	3016,63	2500,00		9264,77
Ivanov	10677,83	13177,83	474,40	1953,61	197,67	2625,68	2500,00		8052,15
Kovalenko	14684,51	17184,51	618,64	2726,10	257,77	3602,51	2500,00		11082,00
Melnyk	15553,64	18053,64	649,93	2893,67	270,80	3814,40	2500,00	1000,00	12739,24
Tkachenko	11121,93	13621,93	490,39	2039,23	204,33	2733,95	2500,00		8387,98
<b>Total</b>	<b>77980,76</b>	<b>92980,76</b>	<b>3347,31</b>	<b>14404,24</b>	<b>1394,71</b>	<b>19146,25</b>	<b>15000,00</b>	<b>1000,00</b>	<b>59834,51</b>

Structure of amount of managers salary for January (month of your variant) for 2018 year

## 8. Teaching Methods

The material taught in lectures, laboratory works and independent works in computer class that is equipped of local area networks, the Internet and the latest software. Lectures are accompanied by the use of presentations, training films and multimedia equipment to facilitate the assimilation of the material.

## 9. Forms of control

Control knowledge in the students of the course “Economic Informatics” provides the following control measures:

- *Self-control* is the primary form of control knowledge’s that are provided by the distance learning courses provide students with a list of questions (questions and answers);
- *Current control* – through direct teacher evaluation system laboratory practical workshops and assignments for independent work;
- *Modular control* – performed remotely in an automated mode or full-time mode, which is the main form of testing;
- *Final control* – a test that consists of full-time during the designated dean’s office or individual schedule, approved curriculum. The basic form of the final control is tested.

## 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.

<b>National Grade</b>	<b>Rating of student, scores</b>
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](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](https://courses.prometheus.org.ua/courses/course-v1:Prometheus+ITArts101+2017_T1/about)
4. Планета Excel [Електронний ресурс] – Джерело: <http://www.planetaexcel.ru/>