МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ

ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ ЕКОНОМІЧНИЙ УНІВЕРСИТЕТ ІМЕНІ СЕМЕНА КУЗНЕЦЯ

«ЗАТВЕРДЖУЮ»
Проректор з навчально-методичної роботи

Каріна НЕМАШКАЛО

ІНФОРМАТИКА

робоча програма навчальної дисципліни

Галузь знань	***05 "Соціальні та поведінкові науки"***
Спеціальність	***051 "Економіка"***
Освітній рівень	***перший (бакалаврський)***
Освітня програма	***Міжнародна економіка***

Статус дисципліни	***обов'язкова***
Мова викладання, навчання та оцінювання	***англійська***

Завідувач кафедри
інформатики та комп'ютерної техніки Сергій УДОВЕНКО

Харків
2023

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE

SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

"APPROVED"
Vice-rector for Educational and Methodical Work

Karina NEMASHKALO

INFORMATICS

syllabus of the educational discipline

Field of study	***05 "Social and behavioral studies"***
Speciality	***051 "Economics"***
Educational level	***first (bachelor)***
Educational program	***International economics***

Course status	***compulsory***
Teaching, learning and evaluation language	***English***

Head
of informatics and computer engineering
department

Serhii UDOVENKO

Kharkiv
2023

APPROVED
by the Department of Informatics and Computer Engineering meeting
Protocol № 6 dated on January 11, 2023.

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Renewal and reapproval list of the syllabus of educational discipline

Academic year	Date of the Department meeting	Protocol №	Signature of department's Head

Annotation

Informatics and word with information is of exceptional importance for any modern organizational, economic and social object in a market economics, because any activity of this object is based on knowledge of a specific situation, which consists in the market of goods, services, labor, means of production, money, etc., and in the enterprise itself. One of the characteristics of modern specialists in economics is the ability to use information technologies in solving a wide range of economic problems. Modern information systems are not only models of certain objects of economics, but also allow to systematically provide all the objectively necessary reliable information for managers and specialists of different levels in automatic mode. Therefore, computer science is objectively inherent in modern economics and is a necessary element of it.

The "Informatics" discipline is a compulsory course and is studied in accordance to the curriculum for the training of specialists of a bachelor's degree in the speciality of "Economics" for all learning forms of "International economics" educational program.

The curriculum includes learning in the form of lectures, laboratory classes and

independent (home) work of students. Laboratory classes, individual work and consultations are performed with the use of personal computers, local networks and the Internet in the computer classes of S. Kuznets KNUE for the practical mastering of the main topics of the discipline. All types of classes are provided with the necessary electronic teaching materials.

In order to increase the learning effectiveness, students have the opportunity to use S. Kuznets KNUE personal education system webpage.

The goal of learning the discipline is to form a system of competencies on the architectural principles of construction and operation of personal computers and computer networks, algorithmization and organization of computational processes, software, as well as the acquisition of competence with modern computer technology and effective use of modern technologies in professional activities to solve various economic problems for future professionals.

The task of course learning is the theoretical and practical training of future professionals in the use of modern information technologies in the economic field for forms of education.

The object of the discipline is the use of information systems and technologies in economics.

The subject of the discipline is the technology of using software to solve economic problems.

Description of the course

Year of study	**1**
Semester	**2**
ECTS credits	**5**
Final control	**pass**

Structural-logical scheme of the course

Prerequisites	Post-requisites
School course of informatics, Foreign language	Operations research and optimization methods, Statistics, Economy of foreign countries, Enterprise economics, International trade, Econometrics, Management, International economy, Personnel management

Competencies and course learning results

Competencies	Learning results
ЗК2. The ability to preserve moral, cultural, scientific values and multiply the achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle	РН7. Explain the models of socio-economic phenomena from the point of view of fundamental principles and knowledge based on understanding the main directions of the development of economic science
ЗК4. Ability to apply knowledge in practical situations	РН10. To perform the analysis of the functioning and development of business entities, to determine functional areas, to calculate the relevant indicators characterizing the effectiveness of their activities
СК10. The ability to use modern sources of economic, social, management, accounting information for the preparation of official documents and analytical reports	
ЗК2. The ability to preserve moral, cultural, scientific values and multiply the achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle	РН12. Apply the acquired theoretical knowledge to solve practical problems and meaningfully interpret the obtained results
ЗК4. Ability to apply knowledge in practical situations	РН13. Identify sources and understand the methodology of determining and methods of socio-economic data obtaining, collect and analyze the necessary information, calculate economic and social indicators
ЗК7. Skills in using information and communication technologies	
СК10. The ability to use modern sources of economic, social, management, accounting information for the preparation of official documents and analytical reports	
ЗК2. The ability to preserve moral, cultural, scientific values and multiply the achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle	РН14. Identify and plan opportunities for personal professional development
ЗК10. The ability to be critical and self-critical	
ЗК2. The ability to preserve moral, cultural, scientific values and multiply the achievements of society based on an understanding of the history and patterns of	РН15. Demonstrate basic creative and critical thinking skills in research and professional communication

development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle	
ЗК7. Skills in using information and communication technologies	
ЗК8. Ability to search, process and analyze information from various sources	
ЗК10. The ability to be critical and self-critical	
СК 15. The ability to assess the socio-economic development of the countries of the world, the level of their investment attractiveness	
СК 16. The ability to analyze the state of the international economy as a systemic complex of interrelationships of subjects and processes of regionalization of global economic relations with the use of modern information technologies	
ЗК3. Ability to abstract thinking, analysis and synthesis	РН16. Be able to use data, provide arguments, critically evaluate logic and form conclusions from scientific and analytical texts on economics
ЗК4. Ability to apply knowledge in practical situations	
ЗК12. Interpersonal skills	
СК10. The ability to use modern sources of economic, social, management, accounting information for the preparation of official documents and analytical reports	
ЗК2. The ability to preserve moral, cultural, scientific values and multiply the achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle	РН17. To perform an interdisciplinary analysis of socio-economic phenomena and problems in one or more professional areas, taking into account risks and possible socio-economic consequences
ЗК8. Ability to search, process and analyze information from various sources	РН19. Use information and communication technologies to solve social and economic problems, prepare and present analytical reports
СК10. The ability to use modern sources of economic, social, management, accounting information for the preparation of official documents and analytical reports	
СК14. The ability to deeply analyze problems and phenomena in one or more professional areas, taking into account economic risks and possible socio-economic consequences	РН20. Master oral and written professional communication skills in national and foreign languages
ЗК3. Ability to abstract thinking, analysis and	РН21. Be able to think abstractly, apply

synthesis	analysis and synthesis to identify the key characteristics of economic systems of various levels, as well as the peculiarities of the behavior of their subjects
ЗК8. Ability to search, process and analyze information from various sources	
СК 15. The ability to assess the socio-economic development of the countries of the world, the level of their investment attractiveness	
СК 16. The ability to analyze the state of the international economy as a systemic complex of interrelationships of subjects and processes of regionalization of global economic relations with the use of modern information technologies	
ЗК2. The ability to preserve moral, cultural, scientific values and multiply the achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle	РН22. Demonstrate flexibility and adaptability in new situations, in working with new objects, and in uncertain conditions
ЗК2. The ability to preserve moral, cultural, scientific values and multiply the achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and technologies, to use various types and forms of motor activity for active recreation and leading a healthy lifestyle	РН23. Show the skills of independent work, demonstrate critical, creative, self-critical thinking
ЗК3. Ability to abstract thinking, analysis and synthesis	
СК 15. The ability to assess the socio-economic development of the countries of the world, the level of their investment attractiveness	
СК 16. The ability to analyze the state of the international economy as a systemic complex of interrelationships of subjects and processes of regionalization of global economic relations with the use of modern information technologies	
СК 17. The ability to make informed management decisions regarding the determination of priority areas of development and the organization of international economic interaction of entities at different levels of management	

3K13. The ability to act socially responsibly and consciously	PH24. Demonstrate the ability to act socially responsibly and consciously based on ethical principles, value and respect cultural diversity, individual differences of people

Course program

Content module 1. Using MS Office to solve economic problems

Topic 1. Theoretical background of economic informatics

1.1. Information and its properties.

Information, data and knowledge. Forms of information presentation, dimensions and quality of information. Systems of classification and coding of information. Concept of economic information. The concept of data. Basic data structures. Information environment, information procedures, information process. Peculiarities of obtaining, processing, analyzing and using economic information.

1.2. Technical base of modern information technologies.

Basic concepts, composition, structure of information systems software: system and application support and programming tools. The evolution of the development of system software and programming tools, their comparative characteristics. Classification of information systems.

Topic 2. Creating/editing of text documents

2.1. Creation and editing of documents in MS Word.

Ways of entering text in document, text formatting. Saving and closing documents, updating documents. Document page layout, page numbering and editing of footers. Creation of a document structure, organization of automatic formatting of document content, adding a hyperlink to a document. Check the spelling of the document. Editing the document using the search and replace mechanism, making notes in the document. Setting a password for a document.

2.2. Work with graphic objects in MS Word.

Creation of figures and inscriptions in documents, use of the drawing library. Creating and editing formulas. Using formula editor. Creating and editing tables in MS Word. Formatting tables, editing table cells, inserting formulas into the table.

2.3. Searching for information on the Internet.

Types of information and evaluation of information. Search engines and their classification. Search for documents and files with different extensions. Search software. Search for legislative acts. Search for work and vacancies. Search for organizations and information about a person. Creation of information search reports and their formatting.

Topic 3. Using table processor to solve economic problems.

3.1. Use of MS Excel functions in calculations.

Creation of electronic tables. Data types in MS Excel. Data formatting in spreadsheets. Organization of calculations in MS Excel. Absolute and relative references. Using cell and range names in formulas. Usage of functions wizard for economic calculations and processing of text arrays. Working with spreadsheet data. Multi-table information processing. Graphic presentation of information when solving economic problems.

3.2. Analysis of table data using MS Excel.

Data processing technology in the environment of table processors using built-in operators and functions. Sorting and searching data in lists. Using forms to enter and edit lists. Using filters and sorting for data analysis. Table processing functions as lists of data, rules for their use. Construction of summary tables. Application of subtotals and slices for data analysis. Data consolidation. Conditional formatting of spreadsheets. Analysis and forecasting of data using graphical means of a spreadsheet processor.

Content module 2. Algorithmization for processing of economic data. Basics of office programming.

Topic 4. Algorithmization of economic problems.

4.1. The concept of an algorithm.

Basic properties of algorithms. Forms of representation of algorithms: informal language and logical schemes. The main types of blocks used in algorithm schemes. Elements of logic algebra: logical operations "AND", "OR", "NOT", concatenation.

4.2. Computing process.

Stages of preparation and organization of solving problems on the computer. Typical types of computing processes and their features. The main constructions of algorithms and their display using graphic schemes: selection design; conditional cycle; cycles with a counter. Examples of classical algorithms.

Topic 5. Basics of office programming

5.1. Characteristics of the visual programming language.

Data types. Features of programming linear processes and branching processes. Use of cyclical processes in solving economic problems. Object-oriented programming. The main properties of the VBA language. Structure of the VBA editor. Characteristics of the built-in application development environment. The main elements of form management. Export and import of objects. Using macro recording tools.

5.2. Custom procedures and functions.

Creating and using custom procedures and functions. Operator processing priorities. Data type conversion functions. Date and time processing functions. Data formatting functions. Technology of working with data arrays. Technology of working with files. Using functions in worksheet formulas. Using the controls in the MX Excel workbook. Using add-ins in MX Excel.

Content module 3. Web-design basics and computer networks.

Topic 6. Computer networks.

6.1. Computer networks.

General information about computer networks and their classification. Topology and access methods in computer networks. Basics of working in a local network: logging in and out of the network, identification of computers, network interface. Principles and features of sharing resources in local computer networks.

Technology of distribution and joint use of resources on local network workstations. Integrity and protection of information in local computer networks, types of access to network resources and their establishment.

6.2. Global computer network - Internet.

General characteristics and stages of Internet development. The concepts of Internet. TCP/IP protocols. IP addressing. Domain Name System (DNS). Protocols of network services. Unified resource index (URL). Basics of work in the global Internet network.

Topic 7. Computer and data safety and security.

7.1. Informational security.

The main directions and purpose of information security: confidentiality of information, integrity of information and related processes, access to information. General measures for the protection of information and computer equipment: identification of users, authorization procedures, protection of files and electronic documents, etc. Using a proxy server and firewalls. The technique of "digital signatures". Information protection by encryption.

7.2. Information protection systems.

Comprehensive electronic business security systems. Computer viruses and protection methods. Antivirus programs. Computer piracy and methods of combating it. Using firewalls while surfing the Internet. Information encryption methods.

Topic 8. Basics of Web-design.

8.1. The essence and social aspects of Web design.

General information about Web technologies, the concept of construction. E-mail, mailing lists and means of business communication, postal services. Online news.

8.1. Creation of web pages.

Tools and methods of building Web pages. Creating Web pages in HTML. Editing of Web pages using basic HTML elements. Formatting a Web document using CSS. Layout of Web sites. Block and adaptive layout of sites. Using programs with visual means of creating Web pages and Web sites. Publication of Web sites on the Internet. Static and dynamic websites. Dynamic design of Web pages with the help of animation effects.

Content module 4. Databases in economics.

Topic 9. Database management systems.

9.1. The concept of a database.

The concept of a database (DB). Architecture of database management systems (DBMS). Functional capabilities of DBMS. Data models. Subject area. Database architecture. Concept of database scheme, SPARS standard. Stages of database design.

9.2. A relational database.

Logical and physical independence of data in the database. The main objects of the database and their characteristics. Relational algebra and relational calculus. Normalization of relations. Data processing anomalies. Rules for the formation of normal forms. Design stages of relational databases. Database planning. Analysis of database requirements. Conceptual, logical and physical design. The entity-relationship data model. Entities, attributes, types of relationships between entities and their characteristics. Simplification of the conceptual model. Transformation of ER-diagrams into relational structures. Tools for automating database design. CASE technologies. Validation of normalization, integrity, and user transactions.

9.3. Construction of relational database objects.

SQL structured query language. Purpose, general characteristics, features of use and technology for creating SQL queries. Instrumental and software tools for creating user interfaces. Form - the main object of entering and viewing database data in the user interface. Publication of information using reports.

9.4. Data repositories.

Software and tools for creating data warehouses. Basic operations in the course of working with multidimensional models of data warehouses. Software query processing tools for extracting information from the data warehouse. Technology of integrated processing and collective access to information resources in the office suite of programs. Technology of operational analysis of OLAP data. The technology of using MS QUERY data source integration programs.

Topic 10. Prospects for the development of information technologies.

Development of technologies for integration of heterogeneous information resources. OLAP - systems of complex data analysis, including hidden development trends. Intelligent data analysis systems. Integration of databases, Web technologies and technologies of text systems. Development of object-oriented databases, geo-informational, temporal and multimedia information systems. Development of deductive databases based on combining technologies of expert systems and databases. Development of user application development technologies. Technologies of distributed processing of information and software for the organization of cloud computing.

Learning and teaching methods

Problematic lectures and laboratory works are used as teaching and learning methods in all topics of the “Informatics” course.

In the case of distance education or the use of distance learning technologies, lectures and laboratory classes are held online in the ZOOM video conference system. All topics of the course use such teaching methods as problem-based lectures, discussions, work in small groups.

Learning results evaluation

The system of evaluation of formed competencies for students takes into account the types of classes, which according to the curriculum of the discipline include lectures and laboratory classes, as well as independent work. Assessment of the formed competencies of students is performed according to the accumulative 100-point system. Control tools in S. Kuznets KNUE include current, modular and final types of control.

Current control is performed during the semester in lectures and laboratory classes and is estimated by the sum of points scored. Maximal current control points ais 60, this allows to pass the course in general.

The control of students 'mastering of the educational material at the lecture is carried out by concentrating the students' attention by asking questions on the previously studied material related to the subject of the lecture.

Assessment of laboratory work includes the evaluation of active work in the classroom and assessment of the defending of laboratory work in accordance with the plan of the discipline, the total number of points is 32.

The evaluation of lecture materials worth 8 points.

Independent (home) work of students includes analysis of literature on the subject, homework, preparation for testing, tests, presentations and defense of laboratory work. The independent work of students based on the results of thematic individual tasks, and includes 4 tasks with 20 points in total.

Test control is performed using a computer in the distance learning system in automatic mode. The tests consist of 20 - 30 questions and are limited in time. The student has only one attempt to complete the test tasks. The maximum score for the test tasks by modules is 20 points.

The final control is performed in the form of a semester credit. The credit is set as the total quantity of points scored on the results of current and modular control. The maximum is 100 points; the minimum quantity that allows student to get credit is 60 points. In case the student receives less than 60 points, the dean of the faculty appoints a commission consisting of three teachers headed by the head of the department and determines the term of re-examination. In case of failure to pass the course, the dean of the faculty offers the student to re-study the discipline during the next academic period independently.

Rating-plan of the course

Topic	**Forms and type of classes**		**Evaluation**	**Max points**
Topic 1, 2, 3	**Work in classes**			
	Lecture	Theoretical foundations of economic informatics. Using a spreadsheet processor to solve economic problems		
Topic 2	Laboratory classes	Creating and editing documents in MS Word		
	Independent work			
	Questions to process at home	Search, selection and review of literary sources on a given topic	Homework	**5**

	Work in classes			
Topic 3	Laboratory classes	Use of MS Excel functions in economic calculations	Laboratory work (passing)	**6**
	Laboratory classes	Analysis of tabular data using MS Excel	Laboratory work (passing)	**6**
			Testing	**5**
			Control work	**5**
	Independent work			
	Questions to process at home	Search, selection and review of literary sources on a given topic	Homework	**5**
	Work in classes			
Topic 4, 5	Lecture	Algorithmization of economic information processing processes. Programming economic problems with a linear process	Testing	**5**
Topic 4	Laboratory classes	Programming economic problems with a linear process	Laboratory work (passing)	**7**
Topic 5	Laboratory classes	Programming of branched and cyclic algorithms for economic information processing	Control work	**5**
Topic 4, 5	**Independent work**			
	Questions to process at home	Search, selection and review of literary sources on a given topic	Homework	**5**
Topic 8	**Work in classes**			
	Lecture	Basics of Web-design		
	Laboratory classes	Creating and formatting Web documents using HTML	Testing	**5**
			Control work	**5**
	Laboratory classes	Responsive layout of the site and placement of the site on the Internet	Laboratory work (passing)	**8**
	Independent work			
	Questions to process at home	Search, selection and review of literary sources on a given topic	Homework	**5**

Topic 9, 10	**Work in classes**			
	Lecture	Construction of relational database objects	Express poll.	**8**
	Laboratory classes	Construction of relational database objects	Testing	**5**
	Laboratory classes	Creating a database. Filling the database. Constructing queries	Control work	**5**
	Laboratory classes	Construction of forms and reports.	Laboratory work (passing)	**5**
	Independent work			
	Questions to process at home	Search, selection and review of literary sources on a given topic		
Total				**100**

Recommended literature

Main

1. Informatics (spec. 6.06.051.100, 6.06.051.130, 6.46.051.130, 1 year of study 2022/2023), assoc. prof. Tiutiunyk O.A. / О. О. Тютюник [Electronic source]. – Access mode: https://pns.hneu.edu.ua/course/view.php?id=7453

Additional

2. Alexander, M., Kusleika, D., & Walkenbach, J. (2019). Excel 2019 bible.

3. Watson, D., & Williams, H. (2019). Cambridge International AS and a Level Computer Science. London: Hodder Education Group.

Internet resources

4. HTML Element Reference. [Electronic source] – Access mode: https://www.w3schools.com/TAGS/default.asp

5. MS Word: get started. [Electronic source] – Access mode: https://edu.gcfglobal.org/en/word/