

**МІНІСТЕРСТВО ОСВІТИ І НАУКИ УКРАЇНИ  
ХАРКІВСЬКИЙ НАЦІОНАЛЬНИЙ ЕКОНОМІЧНИЙ  
УНІВЕРСИТЕТ ІМЕНІ СЕМЕНА КУЗНЕЦЯ**

**ЗАТВЕРДЖЕНО**

на засіданні кафедри  
інформатики та комп'ютерної техніки  
Протокол № 1 від 29.08.2023 р.

**ПОГОДЖЕНО**

Проректор  
роботи

з навчально-методичної

Каріна НЕМАШКАЛО



**ІНФОРМАЦІЙНІ ТЕХНОЛОГІЇ**

**робоча програма навчальної дисципліни (РПНД)**

Галузь знань	<b>29 «Міжнародні відносини»</b>
Спеціальність	<b>292 «Міжнародні економічні відносини»</b>
Освітній рівень	<b>перший (бакалаврський)</b>
Освітня програма	<b>«Міжнародний бізнес»</b>

Статус дисципліни	<b>обов'язкова</b>
Мова викладання, навчання та оцінювання	<b>українська</b>

Розробники:  
к.т.н., доц.  
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Ольга ТЮТЮНИК  
Сергій УДОВЕНКО

Завідувач кафедри  
інформатики та комп'ютерної  
техніки

Сергій УДОВЕНКО

Гарант програми

Наталія ПАРХОМЕНКО

**Харків**

**2023**



## INTRODUCTION

With the modern development of information systems, most of the tasks that the manager solves are translated into the language of algorithms and entered into application programs, which allows to achieve the most economical solution in the shortest time. When using such technologies, the effectiveness of the manager's activity increases significantly. The use of information technologies in the manager's activities is the only way to achieve competitiveness in the modern market. Information technologies are divided into different types with different tasks and depth of coverage of the subject of management. A correct presentation of the types of information systems and the tasks they solve is a prerequisite for a modern manager. A well-chosen information system is only part of success. Efficiency of use is the main criterion by which a manager should be distinguished in modern conditions. Under such conditions, the training of highly qualified specialists who could not only competently solve the issue of choosing an information system, but also organize management processes with the help of the selected information system and information technologies, and know how to select and calculate the necessary parameters of the business project, becomes important. All this determines the relevance of studying the course "Information Technologies".

The course "Information technologies" is a mandatory educational discipline and is studied in accordance with the curriculum for training students of higher education in specialty 292 "International Economic Relations" of the educational program "International Business" of the first (bachelor's) level of all forms of education.

The program of the course provides for training in the form of lectures, laboratory classes and independent work of students of higher education. For the practical learning of the main topics of the discipline, laboratory classes, individual work and consultations are provided, which are carried out using personal computers, local networks and the Internet in the computer classrooms of Simon Kuznets Kharkiv National University of Economics.

All types of classes are provided with the necessary printed and electronic methodical materials.

In order to increase the effectiveness of studying an academic discipline, students of higher education can use the distance learning system of Simon Kuznets Kharkiv National University of Economics.

The purpose of the course "Information Technologies" is the formation of future specialists' competencies in the use of information systems and computer technologies in international business.

The task of studying the course "Information Technologies" is theoretical and practical training in the use of modern information technologies by future specialists in the "International Business" specialty.

The object of the course is information technology in the field of international business.

The subject of course is the study of existing and prospective information technologies for the automation of information processes in international business.

The learning outcomes and competencies formed by the course are defined in table 1.

Table 1

**Learning outcomes and competencies formed by the course**

<b>Learning outcomes</b>	<b>Competencies</b>
LO 3.	GC 7.
LO 16.	GC 7.
LO 24.	GC 7.
LO 26.	GC 7.

where, GC 7. Skills in using information and communication technologies.

LO 3. Use modern information and communication technologies, general and special purpose software packages.

LO 16. Demonstrate knowledge of the state of research in international economic relations and the world economy in an interdisciplinary combination with political, legal, and natural sciences.

LO 24. Justify the choice and apply information and analytical tools, economic and statistical methods of calculation, complex analysis techniques and methods of monitoring the state of world markets.

LO 26. To manage international business, form, develop and implement strategies for personnel management of an international company, marketing, competitive, innovative, financial activities and others, taking into account the direction of activity of the subject of international business, taking into account the priorities of the smart-specialization of the Kharkiv region.

## **COURSE CONTENT**

**Content module 1: The technology of processing international business materials using Microsoft Office.**

**Topic 1: Modern information technologies and their use in international business.**

**1.1.** Information technologies and their role in modern society.

Information technologies and their place in the field of management of international business processes. Types of information technologies. Use of information and computer technologies in international business.

**1.2.** Information and its properties.

Information, data and knowledge. Forms of information presentation, dimensions and quality of information. Information classification and coding systems. 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.

### **1.3. 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.

## **Topic 2. Creating tools for presenting economic information using a word processor Microsoft Word 2016.**

### **2.1. Create and edit documents in Microsoft Word 2016.**

Ways to enter the text of the document, text formatting. Saving and closing documents, updating documents. Document page layout, page numbering and footer editing. Creating a document structure, organizing automatic formatting of the document content, adding hyperlinks to the document. Checking the spelling of the document. Editing a document using the search and replace mechanism, making notes in the document. Enter the password in the document.

### **2.2. Working with graphics in Microsoft Word 2016.**

Graphic objects as a means of presenting economic materials. Creating figures and inscriptions in documents, using a library of drawings. Using mathematical formulas when creating economic materials: using the Equation 3.0 formula editor. Creating and editing tables in Microsoft Word 2016. Formatting tables, editing table cells, inserting formulas into a table.

### **2.3. Search 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 legislation. Job search and vacancies. Search for organizations and information about people. Creating information retrieval reports and their formatting.

## **Topic 3. Technology of economic data processing by means of Microsoft Excel 2016.**

### **3.1. Processing of numerical data by means of Microsoft Excel 2016.**

Spreadsheets, their purpose and capabilities. Download and main window of Microsoft Excel 2010. Creating spreadsheets. Data types in Microsoft Excel 2016. Formatting data in spreadsheets. Organization of calculations in Microsoft Excel 2016. Absolute and relative references. Using cell names and ranges in formulas. Application of the function wizard for economic calculations and processing of text arrays. Working with spreadsheet data. Multi-table information processing.

### **3.2. Using Microsoft Excel 2016 functions in economic calculations.**

Data processing technology in the environment of spreadsheets using built-in operators and functions. Organize and search data in lists. Use forms to enter and edit lists. Using filters and sorting to analyze data. Functions of processing tables as data lists, rules of their use. Construction of summary tables. Application of subtotals and delimiters for data analysis. Data consolidation. Conditional formatting of spreadsheets. Data analysis and forecasting by graphical means of a spreadsheet processor.

**Content module 2: Use of integrated packages of mathematical calculations for solving problems of international business.**

**Topic 4. Features of programming in integrated packages of mathematical calculations**

**4.1. Modeling tools.**

Basic integrated mathematical packages. Modeling and programming of economic problems using mathematical packages.

**4.2. Basics of work in R. Programming with the help of the R package.**

R Studio system components. Fundamentals of calculation in R: numerical and symbolic output operators. Mathematical expressions and built-in functions. Variables and assignment operator. User functions. Types of numbers. Formula editor interface elements. Introduction of formulas. The principle of programming in R.

**Topic 5. Solving international business problems using the R package.**

**5.1. Construction of graphs in R.**

Types of graphs. Creating a schedule. X-Y graph of two variables. X-Y graph function. Construction of several series of data. Three-dimensional graphics. Debugging and commenting on programs. Error messages.

**5.2. Algebraic calculations.**

Operators: arithmetic, computational, logical operators, matrix operators, expression operators. Functions: elementary, auxiliary, current time output. Algebraic transformations. Decomposition of expressions. Simplification of expressions. Decomposition into factors. Calculation of the polynomial coefficient.

**Content module 3. Basics of Web design**

**Topic 6. Network technologies**

**6.1. Computer networks.**

General information about computer networks and their classification. Topology and methods of access in computer networks. Basics of work in a local area network: entrance and exit from a network, identification of computers, the network interface. Principles and features of resource sharing in local computer networks.

Technology of resource allocation and sharing on LAN workstations. Integrity and protection of information in local computer networks, types of access to network resources and their installation.

**6.2. The global computer network is the Internet.**

General characteristics and stages of development of the Internet. Concepts of building the Internet. TCP / IP protocols. IP addressing. Domain Name System (DNS). Network service protocols. Unified Resource Index (URL). Basics of working on the global Internet.

**Topic 7. Organization of computer security and information protection**

**7.1. Informational security.**

The main directions and purpose of information protection: confidentiality of information, integrity of information and related processes, access to information.

General information and computer security measures: user identification, authorization procedures, protection of files and electronic documents, etc. Using a

proxy server and firewalls. Method of "digital signatures". Protection of information by encryption.

### **7.2. Cybersecurity systems.**

The influence of the human factor on the preservation of information. Integrated e-business security systems. Computer crime and abuse: data manipulation, scanning, "Trojan horse". Computer viruses and methods of combating them. Computer piracy and methods of combating it.

## **Topic 8. Basics of Web design**

### **8.1. The essence and social aspects of Web-design.**

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

### **8.2. Creating Web-pages.**

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

## **Content module 4. Design and use of databases and data warehouses in international business**

### **Topic 9. Software tools for working with databases and data warehouses**

#### **9.1. The concept of a database.**

Database (DB) concept. Architecture of database management systems (DBMS). DBMS functionality. Data models.

Subject area. Database architecture. The concept of the database schema, SPARS standard. Stages of database design.

#### **9.2. Relational database.**

Logical and physical independence from the data in the database. The main objects of the database and their characteristics. Relational algebra and relational calculus. Normalization of relations. Anomalies of data processing. Rules for the formation of normal forms. Stages of relational database design. Database planning. Analysis of database requirements. Conceptual, logical and physical design.

Entity-connection data model. Entities, attributes, types of relationships between entities and their characteristics. Simplification of the conceptual model. Conversion of ER-diagrams into relational structures. Database design automation tools. CASE technology. Verification of normalization, integrity and user transactions.

#### **9.3. Construction of relational database objects.**

Structured SQL query language. Purpose, general characteristics, features of use and technology of creation of SQL-queries.

Tools and software tools for creating user interfaces.

Form is the main object of entering and viewing database data in the user interface. Publication of information using reports.

#### 9.4. Data warehouses.

Software and tools for creating data warehouses. Data warehouses such as "Star" and "Snowflake". Basic operations when working with multidimensional models of data warehouses. Request processing software for retrieving information from the data warehouse.

Technology of integrated processing and collective access to information resources in the office software package. OLAP data analysis technology. Technology of using MS QUERY data source integration programs.

The list of practical (seminar) / laboratory studies in the course is given in table 2.

Table 2

**The list of practical (seminar) ) / laboratory studies**

Name of the topic and/or task	Content
Topic 1-3. Laboratory work. Task 1	Creation of a single document consisting of several sections. Supplementing the document with content, hyperlinks to move between sections of the document and title page. Text formatting
Topic 1-3. Laboratory work. Task 2	Performing tasks with absolute and relative references, performing calculations using Microsoft Excel 2016
Topic 1-3. Laboratory work. Task 3	Construction of graphs, charts based on tabular data. Construction of three-dimensional diagrams, graphs of functions, sparklines
Topic 1-3. Laboratory work. Task 4	Maintaining a subject area database using Microsoft Excel 2016: use of logical, mathematical, etc. functions, sorting, auto-filtering, advanced filtering, intermediate summaries. Construction of summary tables
Topic 5. Laboratory work. Task 5	Study of the basic commands of the R package, study of the possibilities of the task of vectors, matrices and carrying out calculations
Topic 5. Laboratory work. Task 6	Writing functions for solving mathematical problems in international business
Topic 5. Laboratory work. Task 7	Carrying out branching calculations in international business problems using the R package
Topic 6-8. Laboratory work. Task 8	Creating dynamic pages using HTML
Topic 6-8. Laboratory work. Task 9	Layout of the site and placement of the site on the Internet
Topic 9. Laboratory work. Task 10	Creating a logical database schema, creating tables and relationships between tables. Filling the database with information
Topic 9. Laboratory work. Task 11	Create queries for fetching data, queries with calculations, queries with parameters, cross queries, queries to add and delete data

The list of self-studies in the course is given in table 3.



### List of self-studies

Name of the topic and/or task	Content
Topic 1-9	Studying lecture material
Topic 1-9	Preparation for laboratory work
Topic 1-9	Preparation for control works

The number of hours of lectures, practical (seminar) studies and hours of self-study is given in the technological card of the course.

## TEACHING METHODS

In the process of teaching the course, in order to acquire certain learning outcomes, to activate the educational process, it is envisaged to use such teaching methods as:

Verbal lectures (topic 1 - 7), problem lectures (topic 8, 9).

Visual (demonstration (topic 1-9)).

Laboratory (topic 1-9), tests (topic 1-9).

In the conditions of the mixed form of education, the presentation of lecture material and/or the conduct of laboratory classes and group and individual consultations takes place using Zoom platforms, in the conditions of the usual classroom form, the classes are held face-to-face, in classrooms and computer rooms.

## FORMS AND METHODS OF ASSESSMENT

The University uses a 100-point cumulative system for assessing the learning outcomes of students.

**Current control** is carried out during lectures, practical, laboratory and seminar classes and is aimed at checking the level of readiness of the student to perform a specific job and is evaluated by the amount of points scored:

– for courses with a form of semester control as grading: maximum amount is 100 points; minimum amount required is 60 points.

**The final control** includes current control and assessment of the student.

Semester control is carried out in the form of a semester exam or grading.

The final grade in the course is determined:

– for disciplines with a form of grading, the final grade is the amount of all points received during the current control.

During the teaching of the course, the following control measures are used:

Current control: laboratory works (60 points), written control works (20 points), tests for current work (20 points).

**Semester control:** Grading.

More detailed information on the assessment system is provided in technological card of the course.

## RECOMMENDED LITERATURE

### Main

1. Швачич Г.Г., Толстой В.В., Петречук Л.М., Іващенко Ю.С., Гуляєва О.А., Соболенко О.В. Сучасні інформаційно-комунікаційні технології: Навчальний посібник. – Дніпро : НМетАУ, 2017. –230 с.
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3. R in Action: Data Analysis and Graphics with R by Dr. Rob Kabacoff.
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5. Математичне моделювання соціально-економічних систем : навч. посібник / Т. В. Шабельник. – Маріуполь : МДУ, 2019. – 135 с. [Електронний ресурс]. – URL: <http://www.repository.hneu.edu.ua/handle/123456789/28090>

### Additional

6. Шевчук І. Б. Інформаційні технології в регіональній економіці: теорія і практика впровадження та використання : монографія. Львів : Видавництво ННБК "АТБ", 2018. 448 с.
7. Кирій В.В. Дослідження ІТ-галузі як важеля економічного розвитку країни і Харківського регіону / В.В. Кирій, М. Е. Зінченко, В. Р. Шелефонтьок // Економіка і суспільство. – 2018. – №19. С. 763 - 769. URL: [http://economyandsociety.in.ua/journal/19\\_ukr/116.pdf](http://economyandsociety.in.ua/journal/19_ukr/116.pdf).
8. Ерфан Є. А. Дослідження ролі інформаційних технологій у сучасному міжнародному бізнесі / Є. А. Ерфан, А. А. Кушнірчук // Науковий вісник Ужгородського національного університету, Серія: Міжнародні економічні відносини та світове господарство, Випуск 33, Частина 1, 2020, С. 49-54.
9. Tiutiunyk V., Tiutiunyk O., Teslenko O., Brynza N. Peculiar properties of creating a system of support to make anti-crisis decisions by experts of the situational center at the cyber protection object. International Scientific And Practical Conference “Information Security And Information Technologies”: Conference Proceedings. Kharkiv – Odesa : Simon Kuznets Kharkiv National University of Economics, 2021. – pp. 53-62. URL: <http://www.repository.hneu.edu.ua/handle/123456789/27716>
10. Тютюник В. В., Калугін В. Д., Писклакова О. О. Оцінка умов створення у Єдиній державній системі цивільного захисту інформаційно-аналітичної підсистеми управління процесами попередження й локалізації наслідків надзвичайних ситуацій на основі аналізу динаміки прояву небезпек на території України. Наукове видання «Комунальне господарство міст. Науково-технічний збірник. Серія: "Технічні науки та архітектура". Харків : ХНУМГ ім. О.М. Бекетова, 2019. №1(147). С. 66–82.

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14. Tutorial: Getting Started with R and Rstudio [Електронний ресурс]. – URL: <https://www.dataquest.io/blog/tutorial-getting-started-with-r-and-rstudio/>

15. Getting started with R and Rstudio [Електронний ресурс]. – URL: <https://ourcodingclub.github.io/tutorials/intro-to-r/>