Syllabus
Course Program

Information Systems and Technologies in Management

Specialty
D3 – Management

Institute
Institute of Economics, Management and International Business

Specialization
–

Department
Department of Management (204)

Educational program
Business administration (in English)

Course type
Mandatory,

Level of education
Second (master's level)

Form of study
Full-time

Semester
1

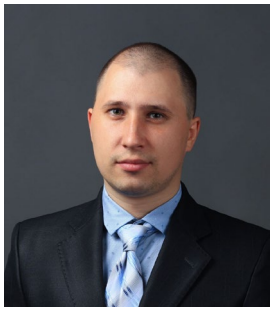
Language of instruction
English

Lecturers and course developers



Valentin Kovshik

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Ph.D. (C.Sc.) in Economic Sciences, associate professor of Management department
Authored and co-authored over 30 scientific and methodological publications.
Courses: Information technology in management, Information technology in economic activity, Riskology, Performance management
More about the lecturer on the department's website



Petro Foshchii

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Ph.D. (C.Sc.) in Economic Sciences, associate professor of Management department
Authored and co-authored over 30 scientific and methodological publications.
Courses: Information technology in management, Information technology in economic activity
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Illia Kravets

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Assistant of the Department of Management

Courses (practical classes): Information systems and technologies in management, Riskology, Introduction to specialty.

More about the teacher on the department's website

General information

Summary

The educational component “Information Systems and Technologies in Management” develops the knowledge and skills necessary for the effective management of business processes involving the use of modern information technologies (IT). Throughout the course, students will learn to organize, plan, implement, monitor, and improve the use of information systems and technologies in organizations, and to effectively achieve strategic goals with the help of IT.

Course objectives and goals

The objective of this academic discipline is to develop the ability to carry out managerial and administrative activities using information technology, and to develop an understanding of the key theoretical principles, modern concepts, and practical methods for using information systems and technologies in operational and administrative activities to achieve the strategic goals of enterprises and organizations.

Format of classes

Lectures, laboratory classes, self-study. Control work (Individual assignment). Differentiated grading.

Competencies

GC3. Skills in using information and communication technologies
SC5. Ability to establish and organize effective communications in the management process

Learning outcomes

LO8. Use specialized software and information systems to address organizational management challenges.

Student workload

The total volume of the course is 120 hours (4 ECTS credits): lectures - 16 hours, laboratory classes - 32 hours, self-study - 72 hours.

Course prerequisites

The prerequisites for this course are knowledge and practical skills, demonstrated by successfully passing the Unified Professional Entrance Exam in Management and Administration (Order of the Ministry of Education and Science of Ukraine No. 157 dated February 11, 2022).

Features of the course, teaching and learning methods, and technologies

Lectures are conducted in an interactive format using multimedia technologies. Laboratory classes are conducted using a project-based approach and focus on modern software. Course materials are available to students via Microsoft Teams.

Program of the course

Academic classes

Lectures

Topics of the lectures	Hours
Topic 1. Introduction to Information Systems and Technologies (IT) in Management *The role of information and IT in modern management. Basic components of IT. IT infrastructure of the enterprise. History of IT. Modern trends and innovations in IT.*	2
Topic 2. Types and functions of management information systems (MIS)	2

Transaction Processing Systems (TPS). Decision Support Systems (DSS). Executive Information Systems (EIS). Customer Relationship Management (CRM) Systems. Enterprise Resource Planning (ERP) Systems.	
Topic 3. The use of IT for communication and information exchange *The role of IT in ensuring managerial communications. Processes of communication and information exchange at enterprises and organizations. The concept of electronic document management, its components. Key features of electronic document management. Advantages of electronic document management systems. Management of implementation of electronic document management.*	2
Topic 4. The use of IT for the analysis of management information *Information flows inside and outside the organization. Opportunities and benefits of information analysis using IT. Office information systems and software. Automation of information processing.*	2
Topic 5. E-commerce *Interaction of elements of the enterprise's IT infrastructure during the implementation of commercial activities of business organizations. The concept and types of e-commerce. Business models of e-commerce. Technologies and platforms for e-commerce. The role of IT in communications with consumers.*	2
Topic 6. Artificial intelligence (AI) *The concepts of artificial intelligence and machine learning. Types of artificial intelligence. Application of artificial intelligence in management activities and business processes. Decision-making opportunities with the help of artificial intelligence. Challenges and limitations of artificial intelligence, ethical problems of the use of AI in enterprises and organizations. Current trends and prospects for the future use of artificial intelligence in the field of management.*	2
Topic 7. Cybersecurity in management *The concept and importance of cybersecurity in enterprises and organizations. The role of management in shaping a secure IT environment of an organization. Common cyber threats and vulnerabilities of IT. Cyber hygiene of managers and personnel. Legal and ethical issues of cybersecurity.*	2
Topic 8. Implementation of IT and management information systems in enterprises and organizations *MIS life cycle. The role of management in MIS deployment. Requirements analysis for the organization's IT infrastructure. Typical methodologies for planning and managing IT implementation and MIS deployment projects.*	2
Total hours	**16**

Laboratory classes

Topics for laboratory classes	Hours	Weighting coefficients *a*
Topic 1. IT infrastructure at the enterprise *Determination of the need for IT in the enterprise. Identification of hardware and software tools and determination of the purpose of their use in management (case method). Planning of IT infrastructure elements and scenarios for their use for organizations and enterprises of various industries.*	4	0,125
Topic 2. Types and functions of management information systems *Review and critical analysis of examples of MIS use in various aspects of management activities (inventory management, performance management, sales management, etc.) Overview of the ERP system on the example of Odoo. Installation, key modules. Basics of conducting transactions and production planning in ERP.*	4	0,125
Topic 3. Means of communication and information exchange	4	0,125

Means of information exchange in enterprises. Planning and creation of graphical models of information flows and information exchange within business processes using software (Camunda Modeler, yEd Graph Editor, draw.io, etc.)		
Topic 4. Analysis of management information *Excel functions for analyzing and aggregating management data: Power Query, Power Pivot. Using Microsoft Power BI to analyze and visualize management information.*	4	0,125
Topic 5. E-commerce *Planning the infrastructure for e-commerce of the enterprise. Consideration and critical analysis of examples of the use of IT tools of e-commerce (case method). Indicators of the effectiveness of e-commerce.*	**4**	0,125
Topic 6. Artificial intelligence (AI) *Basics of using AI to analyze and forecast management information. Analysis of transactions and management decisions using Weka software. Using generative AI to simplify the daily tasks of a manager. Basics of working with AI agents.*	**4**	0,125
Topic 7. Cybersecurity in management *Analysis of examples of cybersecurity problems at the enterprise (case method). Management decisions on cybersecurity. Development of an action plan for the manager's personal cyber hygiene.*	**4**	0,125
Topic 8. Project management for IT implementation and deployment *Planning processes and resources for the development and implementation of a conditional element of the organization's information system. Prioritizing tasks. Distribution of tasks and roles, organization of communications in the team. Basics of using software for IT project management (on the example of Jira and ProjectLibre).*	**4**	0,125
Total	**32**	$\sum_{i=1}^{n} a_i$=1

Control works

Students are provided with two tests to test theoretical knowledge, 20 test questions each. Sets of questions are formed randomly from the list. Each question has only one correct answer.

Topics for control works	Weighting coefficients *b*
Test №1	0,5
Test №2	0,5
Total	$\sum_{i=1}^{m} b_i$=1

Self-study

Self-study (72 hours) includes independent study of theoretical material and the completion of an individual assignment.

Work on theoretical materials

Topics for self-study	Hours
Topic 1. Introduction to information technology in management information as a strategic resource of the organization *The impact of digitalization on modern management approaches. Evolution of Information Technology in Business and Global Trends in Digital Transformation Innovative Solutions and Their Role in Improving Management Efficiency*	8
Topic 2. Types and functions of management information systems *Classifications of information systems. Integration of different types of information systems into business environment. Practical use of IT in managerial decision-making. The role of business process automation in the activities of an enterprise*	8
Topic 3. The use of IT for communication and electronic document management *Digital communication channels in organizations. Organization of electronic document management at the enterprise. Standardization and unification of electronic documents. Document lifecycle management. Problems of implementation and adaptation of electronic document management*	8
Topic 4. The use of IT for the analysis of management information *Data sources for management analysis. Tools for processing and visualizing information in the work of a manager. Principles of data-driven decision-making*	8
Topic 5. E-commerce *Models of interaction between market participants in the online environment. E-commerce Infrastructure. Tools for promoting goods and services online. Consumer behavior in the digital environment. Risks and prospects for the development of e-commerce.*	8
Topic 6. Artificial intelligence *The history of using AI to optimize business processes. Simplification of management decisions with the help of intelligent systems. Social and ethical challenges of AI adoption. Prospects for the development of artificial intelligence in management.*	8
Topic 7. Cybersecurity in management *Principles of information security system of the enterprise. Formation of a culture of safe behavior of personnel in the digital environment. Organizational measures to ensure cybersecurity. Liability for information security violations.*	8
Topic 8. Implementation of IT and management information systems in enterprises and organizations *Strategic planning of IT development in the organization. Assessment of the effectiveness of the implementation of information systems. Change management in digital transformation. Selection of software solutions and IT suppliers.*	8
Total hours	**64**

Topics for individual assignments

Analysis of management information using business intelligence software (Microsoft Excel, Microsoft Power BI) with the preparation of a report. The assignment must be completed according to the variants of the initial data provided by the lecturer.	
Total hours	**8**

Non-formal education

Non-formal education includes professional courses/training, civic education, online education, professional internships, etc. The recognition of learning outcomes acquired in non-formal education applies to both mandatory and elective academic courses/educational components. The elements of non-

formal education recommended in the syllabus can be recognized through a simplified procedure without additional validation of the results (without creation of a subject committee).

Recommended training courses, internships

1. Online course "Digital Communications in Global Environment" (in Ukrainian)
URL: https://prometheus.org.ua/prometheus-free/digital-communications-global/ (for topic 3)
2. Online Course "Artificial Intelligence in Business: How AI Can Increase Profits" (in Ukrainian). URL: https://prometheus.org.ua/prometheus-free/artificial-intelligence-business/ (for topic 6)
3. Online course (educational series) "Attention! Cyber Fraudsters" Diia.Education (in English and Ukrainian). URL: https://osvita.diia.gov.ua/courses/attention-cyber-fraudsters (for topic 7)
4.

Literature, training materials, and information resources

Main literature

1. Taherdoost, H. An overview of trends in information systems: emerging technologies that transform the information technology industry. Cloud Computing and Data Science, 2023. P. 1-16. URL: https://ssrn.com/abstract=4626736
2. Roy, S.; Daniel, C.; and Agrawal, M.. Fundamentals of Information Technology. 2023. URL: https://digitalcommons.usf.edu/dit_tb_eng/19
3. Bourgeois D., Smith J., Wang S. et al. Information Systems for Business and Beyond. 2019. URL: https://digitalcommons.biola.edu/open-textbooks/1
4. Lacher M. Business Computers 365 Version 2.0. Minnesota State Community & Technical College, 2023. 268 p. URL: https://open.umn.edu/opentextbooks/textbooks/business-computers-365-lacher

Additional materials

5. Інформаційні системи в менеджменті: підручник. / за ред. В. О. Новак, В. В. Матвєєв, В. П. Бондар, та ін. Київ : Каравела, 2023. 536 с.
6. Excel. Data Import and Analysis 2024. URL: https://support.microsoft.com/uk-ua/office/%D1%96%D0%BC%D0%BF%D0%BE%D1%80%D1%82-%D1%96-%D0%B0%D0%BD%D0%B0%D0%BB%D1%96%D0%B7-%D0%B4%D0%B0%D0%BD%D0%B8%D1%85-ccd3c4a6-272f-4c97-afbb-d3f27407fcde
7. Get started with Power BI Desktop. 2023/ URL: https://learn.microsoft.com/en-us/power-bi/fundamentals/desktop-getting-started

Grading system

The final grade for the educational component is determined by the lecturer and is based on topics, types of activities, etc., in accordance with the syllabus. It is an integrated assessment of the results of all types of student learning activities. The final grade should reflect all the grades for the different parts of the educational process, taking into account their weighting coefficients *k*:

Continuous assessment (during workshops, seminars, laboratory classes) k_1	Control works (if any), k_2	Individual assignment (if any), k_3	Final assessment (exams), k_4
0,3	0,4	0,3	–

The sum of the coefficients must be equal to one: $k_1 + k_2 + k_3 + k_4 = 1$. The weighting coefficients for the final assessment are decided by the course developer..
The final grade is calculated using the following formula:

$$G = C \cdot k_1 + K \cdot k_2 + I \cdot k_3 + E \cdot k_4$$

where: C – weighted average score for the continuous assessment

I – individual assignment grade
K – weighted average score for the continuous assessment
E – final assessment (exam) grade

$$C = \frac{C_1 \cdot a_1 + C_2 \cdot a_2 + \ldots + C_n \cdot a_n}{\sum_{i=1}^{n} a_i}$$

where: a_i - weighting coefficient for each laboratory class.

$$K = \frac{K_1 \cdot b_1 + K_2 \cdot b_2 + \ldots + K_m \cdot b_m}{\sum_{i=1}^{m} b_i}$$

where: b_i - weighting coefficient for each control work.

The assessments for each component (C, K, I, etc.) are based on a 100-point scale in line with the provisions of the "Criteria and System for Assessing Knowledge and Skills, and Rating of Higher Education Students" of the National Technical University "Kharkiv Polytechnic Institute."

The final grade is finalized as the calculated value of *G*, rounded up to the nearest integer.

Grading scale

Total points	National	ECTS
90–100	Excellent	A
82–89	Good	B
75–81	Good	C
64–74	Satisfactory	D
60–63	Satisfactory	E
35–59	Unsatisfactory (requires additional learning)	FX
1–34	Unsatisfactory (requires repetition of the course)	F

Norms of academic integrity and course policy

Students must adhere to the Code of Ethics of Academic Relations and Integrity of NTU "KhPI": to demonstrate discipline, good manners, kindness, honesty, and responsibility. Conflict situations should be openly discussed in academic groups with a lecturer, and if it is impossible to resolve the conflict, they should be brought to the attention of the Institute's management.
Regulatory and legal documents related to the implementation of the principles of academic integrity at NTU "KhPI" are available on the website: http://blogs.kpi.kharkov.ua/v2/nv/akademichna-dobrochesnist/

Approval

Approved by 31.08.2026 **Head of the department**
Nataliia SHMATKO

31.08.2026 **Guarantor of the educational program Business Administration**
Pavlo BRIN