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

ЗАТВЕРДЖЕНО
на засіданні кафедри
інформаційних систем
Протокол № 1 від 27.08.2024 р

ПОГОДЖЕНО
Проректор з навчально-методичної роботи

_____ Каріна НЕМАШКАЛО

ІНФОРМАЦІЙНІ СИСТЕМИ В ОРГАНІЗАЦІЇ ТА МЕНЕДЖМЕНТІ ІТ-ПІДПРИЄМСТВ

робоча програма навчальної дисципліни (РПНД)

Галузь знань	**12 "Інформаційні технології"**
Спеціальність	**122 "Комп'ютерні науки"**
Освітній рівень	**другий (магістерський)**
Освітня програма	**"Комп'ютерні науки"**

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

Розробник:
к.е.н., доцент підписано КЕП Олена ПЛОХА

Завідувач кафедри
інформаційних систем
_____ Дмитро БОНДАРЕНКО

Гарант програми підписано КЕП Сергій МІНУХІН

Харків
2024

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS

APPROVED
at the meeting of the Information Systems department

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Protocol No. 1 dated August 27, 2024

AGREED
Vice-rector for educational and methodical work

_____ Karina NEMASHKALO

INFORMATION SYSTEMS IN THE ORGANISATION AND MANAGEMENT OF IT ENTERPRISES

program of the course

Field of knowledge	**12 "Information technologies"**
Specialty	**122 "Computer Sciences"**
Study cycle	**second (master's)**
Study programme	**"Computer Sciences"**

Course status	**mandatory**
Language	**English**

Developer: Doctor of Economics, associate professor	digital signature	Olena PLOKHA
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Head of Study Programme	digital signature	Serhii MINUKHIN

Kharkiv
2024

INTRODUCTION

In connection with the development of computer information systems and technologies and the growth of their role in the activities of enterprises and organizations in various fields of activity, the issue of increasing the efficiency of IT enterprise management is becoming increasingly urgent. In order to effectively organize the work of an IT enterprise, it is necessary to have appropriate software, organizational and technical support. At the same time, the ability to quickly adapt the activities of IT enterprises to changes in the external environment will play an important role.

The purpose of teaching the course "Information systems in the organization and management of IT enterprises" (hereinafter "IS in the organization and management of IT enterprises") is to develop the competence of applicants in the implementation and support of information systems and the use of information processing technologies, decision support systems in the organization the work of enterprises in the field of information technologies (IT).

The tasks of the course "IS in the organization and management of IT enterprises" are:

1) acquiring competences regarding the organization of the work of an IT enterprise, designing an information system for managing the activities of an IT enterprise, considering it as a complex business process, determining the functional and structural content, information flows and data storage models;

2) acquisition of competencies in the management of an IT enterprise, exploring marketing, organizational and financial aspects of activity, using modern information systems, technologies and software.

The object of the course is the process of organization and management of the IT enterprise.course

The subject of the course is the methods and tools of the organization and management of an IT enterprise.

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

Table 1

Learning outcomes and competencies formed by the course

Learning outcomes	**Competencies**
LO1	SC04
LO2	GC01, SC02, SC03, SC10, SC11
LO3	SC01
LO4	GC01, GC02, SC05, SC10, SC11
LO5	GC01, GC03, GC05, GC07, SC05, SC10, SC11
LO6	GC01, GC03, SC011
LO10	GC01, GC02, GC03, GC05, SC05, SC07, SC08, SC11
Learning outcomes	**Competencies**

LO11	GC02, GC07
LO13	GC02, SC07, SC10
LO14	GC07
LO15	GC02, GC03, GC05, SC04, SC05, SC11
LO16	SC03
LO18	GC03, SC02, SC05
LO19	SC05
LO 20	SC04, SC05,SC08

where,GC01. Ability to abstract thinking, analysis and synthesis.
GC02. Ability to apply knowledge in practical situations.
GC03. Ability to communicate in the national language both orally and in writing.
GC05. Ability to learn and master modern knowledge.
GC07. Ability to generate new ideas (creativity).
SC01. Awareness of the theoretical foundations of computer science.
SC02. The ability to formalize the subject area of a certain project in the form of an appropriate information model.
SC03. Ability to use mathematical methods to analyze formalized models of the subject area.
SC04. The ability to collect and analyze data (including large data) to ensure the quality of project decision-making.
SC05. Ability to develop, describe, analyze and optimize architectural solutions of information and computer systems for various purposes.
SC07. Ability to develop software according to formulated requirements, taking into account available resources and constraints.
SC08. The ability to develop and implement software development projects , including in unpredictable conditions, with unclear requirements and the need to apply new strategic approaches, use software tools to organize teamwork on the project .
SC10. The ability to evaluate and ensure the quality of IT projects , information and computer systems of various purposes, to apply international standards for assessing the quality of software of information and computer systems, models for assessing the maturity of information and computer systems development processes.
SC11. Ability to initiate, plan and implement the development processes of information and computer systems and software, including its development, analysis, testing, system integration, implementation and support.
LO1. Have specialized conceptual knowledge that includes modern scientific achievements in the field of computer science and is the basis for original thinking and conducting research, critical understanding of problems in the field of computer science and at the border of fields of knowledge.
LO2. Have specialized computer science problem-solving skills necessary for conducting research and/or carrying out innovative activities in order to develop new knowledge and procedures.
LO3. It is clear and unambiguous to convey one's own knowledge, conclusions and arguments in the field of computer science to specialists and non-specialists, in particular to people who are studying.
LO4. Manage work processes in the field of information technologies, which are complex, unpredictable and require new strategic approaches.
LO5. Evaluate the results of teams and collectives in the field of information technologies and ensure the effectiveness of their activities.
LO6. Develop a conceptual model of an information or computer system.
LO10. To design architectural solutions of information and computer systems for various purposes.
LO11. Create new algorithms for solving problems in the field of computer science, evaluate their effectiveness and limitations on their application.
LO13. Assess and ensure the quality of information and computer systems for various purposes.

LO14. Test the software.
LO15. Identify the needs of potential customers regarding the automation of information processing.
LO16. Conduct research in the field of computer science.
LO18. Collect, formalize, systematize and analyze the needs and requirements for the information or computer system being developed, operated or supported.
LO19. To analyze the current state and global trends in the development of computer sciences and information technologies.
LO20. Develop algorithms and software components of computer information systems for high-performance big data processing systems (including distributed and parallel computing) and cloud platform services.

COURSE CONTENT

Content module 1. Organization of enterprise activities in the field of information technologies

Topic 1. Business in the field of information technologies and trends in its development

1.1. The essence of information business and its features.

Concept and economic and organizational foundations of information business. Criteria by which the concept of "information company" is defined. Factors influencing the development of information business. Consumer groups of information goods. Main features of information business.

1.2. Information products and services (IPP).

Concept of information product and information service. International standards of industrial classification of the service sector and other types of information services. Horizontal and vertical movement of information in the information business. PPI classification.

1.3. Entrepreneurship environment in the field of information technologies.

Types of the external environment of entrepreneurship: intellectual resources , potential consumers and communication channels. Regulatory and legal provision in the field of informatization. Main aspects of international cooperation in the field of informatization. Forms of state regulation of informatization processes in developed countries.

1.4. Information business model.

Structural and functional model of information business. General business model. Main functions of the business: finance, marketing, personnel and logistics. Information and communication technologies.

1.5. The information market and the mechanism of its functioning.

The concept and structure of the information market. Mechanism of functioning of the information market. The structure of the distribution system. Characteristics of producers of information products and services. Subjects of the information market: customers, developers, owners, intermediaries. Models of selling information products. Scheme of relations between the vendor, distributor, dealer and end user. Partnership levels: ordinary partner, partner with deep connections, honorary partner.

1.6. Stages, trends and prospects of the development of the information market of Ukraine.

Stages of development of the information market of Ukraine. Trends in the development of the information market of Ukraine. Components of the National Informatization Program. Projects on the creation of a national system of information resources of Ukraine. Disadvantages of Ukraine's information policy on informatization of the country.

Topic 2. Creation and organization of activities of IT industry companies

2.1. Organizational and legal forms of business, advantages and disadvantages of organizational and legal forms for IT enterprises.

Subjects of entrepreneurial activity. Models of entrepreneurial behavior. Types of entrepreneurial activity. Types of organizational and legal forms of business. Classification of organizational forms of information business. Classification groupings of information business enterprises inherent in the information field. Information company founders and their functions. General requirements for the content of founding documents of companies. The order of state registration of an enterprise. Determination of strategic needs in information products and services.

2.2. The main stages and stages of creating an IT enterprise.

Preparatory stage: making a decision on entrepreneurial activity based on an IT idea; determination of the goals of entrepreneurial activity, development of the enterprise development strategy; choice of organizational and legal form of entrepreneurship; choosing the location of the enterprise. Establishment stage: determining the composition of the founders; determining the amount of initial capital; development of the name of the enterprise, preparation of constituent (founding) documents; enterprise registration; registration of enterprise attributes. Organizational stage: organization of enterprise management; formation of resource supply and product sales networks; personnel selection; organization of the production process.

2.3. Documentation of the creation of an IT enterprise.

Company charter and founding agreement. Certificate of state registration. Obtaining a certificate from EDRPOU. Registration in the statistical authorities. Registration by the payer of a single social contribution. Registration with the State Tax Service.

Topic 3. Designing a management system for IT enterprises

3.1. Peculiarities of management of IT companies.

The objective necessity of managing subjects of innovative activity. Organization of management of IT enterprise activities. Characterization of the main stages of the processes of organization and management of IT enterprise activities. Sources of funding for IT enterprise activities. An innovative component in the activity of an IT enterprise. Models of the innovation process.

3.2. Key aspects of operational management.

The essence of operational management of the IT enterprise. Problems and tasks of

operational management at the stages of the life cycle of an IT enterprise. Information base and its effective use.

3.3. The main criteria for choosing organizational structures for managing the activities of an IT enterprise.

The place and role of organizational structures in the management of IT enterprise activities. Characteristics of organizations of mechanistic and organic types. Peculiarities of organizational structures for managing IT enterprise activities. Principles and stages of building organizational structures for managing IT enterprise activities. Justification of the choice of organizational structures for managing the activities of an IT enterprise at the stages of the life cycle.

3.4. Designing an information system for managing the activities of an IT enterprise.

Concepts of development and design of information systems. Stages of development of information systems. Support of business processes by specialized information systems. Processes of organizational planning of information systems: main stages. Formation of business development paths of the organization to create optimal information system architecture and operational plans. A systematic approach to the planning of information systems in innovative activities. Information systems planning methodology: approaches and scenarios. Models of organization development using computer packages to support management decision-making.

Content module 2. Use and implementation of information systems in the organization and management of an IT enterprise

Topic 4. Information systems and market research technologies

4.1. Marketing activities of IT enterprises.

Identification of the concept of "information products and services" and " information market". Determination of the situation of the information market. The main principles and functions of the formation and functioning of the information market, prerequisites for its emergence and factors contributing to its development at the stage of revolutionary transformation of economic systems.

4.2. Market research technology for IT products and services.

Content of marketing research of the market of IT products and services and its features. Concepts, objects of marketing research. Marketing information environment. Principles and conceptual approaches to marketing research. The technology of conducting marketing research of the innovation market: organizational aspects. Determining the need for innovation. Forecasting the market capacity of an innovative product using the example of IT products and services.

4.3. Use of information systems and technologies in market research of IT products and services and marketing activities.

Typical technological means of searching, collecting and accumulating marketing information. Technological means of supporting the adoption of marketing decisions. Information and analytical methods and models of support for making marketing decisions (types of instrumental models; parametric analysis technologies using "what-

if" methods; statistical models of making marketing decisions taking into account the uncertainty factor; selective method of determining demand; implementation of optimization models). Modern software products for managing marketing activities. Organization of marketing research using computer information processing technologies. Information technology for solving problems related to market research and demand for innovative products. Automation of calculations for establishing the innovation market capacity. Automation of calculations for research and evaluation of the innovation market situation. Information technology for solving problems in the management of advertising activities regarding the promotion of IT products and services on the market.

4.4. Information marketing.

Concept and functions of information marketing. Features of information marketing. The place of the marketing function in the business system. Relationship between tasks and sub-functions of marketing. Activities carried out within the marketing sub-functions . The essence of missionary marketing (consumer demand for information products and services is formed by explaining the advantages and features of new information products). Conceptual modeling of information marketing process. Analysis of market opportunities of the enterprise. Generalized scheme of interaction of information market participants. Scheme of information marketing process. Characteristics of the information marketing process. Research and assessment of the dynamics of public and specific information needs. Estimating the costs and results of creating a specific PPI. Development of a marketing complex.

4.5. Marketing information system.

Marketing information system. Internal reporting system. External information collection system. Marketing information analysis system.

4.6. Life cycle analysis of information products and services.

Product life cycle. Characteristics of the main stages of a typical product life cycle. Predominant types of consumers at certain stages of the life cycle of software products. Features of the life cycle of information products and services. Organizational and structural forms of information marketing management. Functional structure of the marketing service. A marketing service structure focused on specific products and services. Market-oriented marketing service structure . Relationship of tasks and sub-functions of marketing.

Topic 5. Information systems and technologies for conducting innovative activities

5.1. Informational and analytical provision of innovative development of the IT enterprise

Existing information and analytical base of innovative development. A system of indicators for evaluating the features and effectiveness of the implementation of improving innovations, which form the basis of information and analytical support for the innovative development of an IT enterprise. Characteristics of changes in the information and analytical activity of an IT enterprise.

5.2. Transformational changes in models of innovative development of an IT enterprise. The main goals, tasks, directions and mechanisms affecting the formation of its information and analytical support. The method of using improving innovations in modeling the innovative development of the enterprise.
5.3. Evaluation of the efficiency of innovative development of enterprises.
The system of indicators and information support of the model of innovative development of the IT enterprise.

Topic 6. Information systems and technologies in the organization of IT enterprise activities

6.1. Determination of organizational aspects of the IT enterprise.
Characterization of the goals of organizational support of the IT enterprise. Definition of the main subdivisions of the organizational plan: organizational form of innovative business; the company's need for personnel to implement an innovative business idea; owners, managers and external consultants of the firm; organizational chart of innovative company management, personnel policy and strategy. Justification of the principles of choosing the form of business organization: financial responsibility of the entrepreneur and readiness for economic risk; system and level of taxation depending on the form of business organization; the ratio of start-up capital and the entrepreneur's own funds; efficiency of business management; taking into account the probability of bankruptcy and liquidation of the firm.
6.2. The use of information technologies in the process of organizing the activities of an IT enterprise and promoting innovative projects.
Development of the organizational structure of the enterprise, focused on innovative development in the ARIS environment. Distribution of duties and responsibilities for the development and promotion of an innovative project using MS Project.
6.3. Organization of interaction at an IT enterprise.
Management of the functionality of the IT enterprise. The main functions of the enterprise. Functional structure of the enterprise. Organization of interaction and powers of divisions of the IT enterprise. The concept and comparison of powers and responsibilities. Distribution of powers between the divisions of the enterprise. The main forms of organization of interaction between the units of the enterprise. Matrix approach to the implementation of IT projects. Advantages and disadvantages of the matrix organizational structure of IT project implementation.

Topic 7. Information systems and technologies for determining the resource provision of an IT enterprise and evaluating the effectiveness of its activities

7.1. The main tasks and structure of the IT enterprise's resource provision plan.
Justification of the main tasks of the resource provision plan. Determining the main types of resources and forecasting the need for them.
7.2. Calculation of the main indicators of the IT enterprise's resource provision plan.

Characteristics of the "Technology Characteristics" subdivision (types of operations performed independently or by subcontractors). The characteristics of the unit "Equipment and premises" contain a list of equipment and software required for the implementation of the technological process; calculations of expenses related to the purchase or rental (leasing) of equipment, software and premises; information on service periods and depreciation deductions. The characteristics of the "Personnel" division consist of determining the need for personnel, assessing the level of personnel qualifications. Determination of the possible influence of external factors on the production and economic activity of the firm. Use of MS Project Expert to determine the resource support for the implementation of an innovative project.

7.3. Determination of the general need for financial resources for the implementation of IT enterprise activities.

The influence of the cost factor on the total amount of activity financing. From process-oriented cost accounting to process-oriented profitability analysis (POAR). Linking business processes to the received income with the help of POAR. Use of POAR for the purpose of finding income factors.

7.4. Determining the efficiency of the IT enterprise.

Calculation and analysis of the main financial indicators. Carrying out a sensitivity analysis of IT projects, which makes it possible to establish the range of variations of the initial assumptions, beyond which the implementation of the proposed business project becomes problematic. Determination of the features of the development of the financial plan: the presence of a specific list of financial documents of a standard form with a single method of calculating the relevant indicators; availability of financial plans drawn up with a three-year perspective; consistency with other sections of the business plan of the IT enterprise; the expediency of working out several scenarios of the development of events; reliability of information and financial calculations, as well as explanation of deviation of financial indicators from industry averages. Preparation of the business plan of the IT enterprise.

The list of laboratory studies in the course is given in table 2.

Table 2

The list of laboratory studies

Name of the topic and/or task	Content
Topic 1, Topic 2. Laboratory work 1	Development of an IT enterprise activity management system using CASE technologies (IDEF0)
Topic 2, Topic 3. Laboratory work 2	Development of an IT enterprise activity management system using CASE technologies (DFD)

Theme 4, - Theme 5. Laboratory work 3	Calculation of demand on the market for information products and services, development of a marketing plan using information technologies
Topic 6. Laboratory work 4	Organizational aspects of the work of an IT enterprise. Distribution of duties and responsibilities between team members during the implementation of the IT project
Topic 7. Laboratory work 5	Development of a resource and financial plan for the work of an IT enterprise using IS. Evaluation of the efficiency of the IT enterprise

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

Table 3

The list of self-studies

Topic name	Content
Topic 1 - 7	Studying lecture material
Topic 1 - 7	Preparation for laboratory classes
Topic 1 - 7	Preparation for the exam

The number of hours of lectures, laboratory classes and hours of independent work is given in the work plan (technological map) for the academic discipline.

TEACHING METHODS

In the process of teaching an educational discipline, in order to acquire certain learning outcomes, to activate the educational process, it is envisaged to use such teaching methods as:
Problem lecture (Topic 1 - 2), mini-lecture and discussion (Topic 3 - 7).
In person (demonstration (Topic 1-7)).
Individual laboratory work (Topic 1 - 3), team laboratory work (Topic 4 - 7)).

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, laboratory 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 an exam: maximum amount is 60 points; minimum amount required is 35 points.
The final control includes current control and an exam
Semester control is conducted in the form of a semester exam (exam). The semester exam (exam) is conducted during the exam session.
The maximum number of points that a student of higher education can receive during the examination (examination) is 40 points. The minimum amount for which the exam

is considered passed is 25 points.
The final grade in the course is determined:
− for disciplines with a form of exam, the final grade is the amount of all points received during the current control and the exam grade.
During the teaching of the course, the following control measures are used:
Current control: defense of laboratory works (38 points), written control works (22 points).
Semester control: Exam (40 points)
More detailed information on the assessment system is provided in technological card of the course.

An example of an examination ticket and evaluation criteria for an course:

An example of an examination ticket

SIMON KUZNETS KHARKIV NATIONAL UNIVERSITY OF ECONOMICS
The second (master's) level of higher education
Specialty "122 "Computer Sciences""
Educational and professional program "Computer sciences".
Semester I
Educational discipline "Information systems in the organization and management of IT enterprises"

EXAMINATION TICKET

Task 1 (diagnostic, 17 points). Build a context diagram and a diagram of the 1st level of decomposition in the IDEF0 standard for a business process [individual option]. When modeling, use the Ramus software product Educational .
Task 2 (heuristic, 23 points). Using the Microsoft Project (MS Project) or GanttPRO package , create a work schedule for the project "Creating a business in the field of information technologies". For this, it is necessary to go through the following stages:
1. Create a project calendar, based on the fact that the duration of the project is 1 calendar year, the work schedule is normal (5 working days and 2 weekend (Saturday and Sunday) days).
2. Structure the project by defining the logical sequence of stages (total tasks), as well as tasks within each stage. Stages of the project (total tasks): Implementation of the IT project ; Justification of the business idea and concept of IT business organization; Development of a business plan; Preparatory stage of IT project implementation .
3. For each stage (total task), propose subtasks .
4. Define control tasks (project milestones) for each stage.
5. Distribute duties and responsibilities for certain project tasks among project participants: director; project manager; HR; marketer; developer; tester .
6. Establish a certain sequence of task performance and connections between them.

7. Set the basic project plan and take screenshots of the project and save them in an MS Word document.

Protocol 1 dated August 27, 2024 was approved at the meeting of the IS Department.

Examiner Olena PLOKHA

Chief of IS Dmytro BONDARENKO

Evaluation criteria

The exam ticket includes one diagnostic task and one heuristic task. Software products such as Ramus are used in the process of performing exam tasks Educational – for developing business process models in IDEF0 standards. The maximum number is 40 points; the minimum that is counted is 25 points. At the same time, for completely correctly completed tasks, the student receives:

Task 1 – 17 points; Task 2 – 23 points.

The final scores for the exam consist of the sum of points for the completion of all tasks, rounded to a whole number according to the rules of mathematics.

Task 1 (diagnostic) is estimated at ***17 points*** as follows:

7 points – correct and complete construction of the context diagram in the IDEF0 standard;

10 points – correct construction of the diagram of the first level of decomposition (definition of functional blocks and interface arcs).

In the event that the parts of the task described above are not fully completed, 0.5 points are deducted from the maximum score . Also, 1 point is deducted for each group of homogeneous non-essential errors (for example, incorrect definition of the source information for the work, lack of all necessary data stores for the task, presence of external links at those levels where they should not be, etc.); 1.5 points are deducted for each group of homogeneous significant errors (for example, incorrect wording of the name of the business process, lack of names of data streams, complete lack of decomposition of data stores at some levels, incorrect from the point of view of the methodology of the location of interface arcs according to the DEF0 standard, etc.) .

Task 2 (heuristic) is estimated at ***23 points*** as follows:

2 points – the project calendar is created according to the task;

6 points – the structure of the project (total tasks) is defined in a logical sequence;

7 points – for each stage (total task), propose subtasks (2-3) that reveal the essence of the total task;

4 points – control tasks (project milestones) are defined for each stage;

4 points – duties and responsibilities for certain project tasks are distributed among the project participants

In the event that the parts of the task described above are not fully completed, 0.5 points are deducted from the maximum score . Also, 1 point is deducted for each group of homogeneous non-essential errors (for example, incorrect definition of the source information for the work, lack of all necessary data stores for the task, presence of external links at those levels where they should not be, etc.); 1.5 points are deducted for each group of homogeneous significant errors (for example, incorrect wording of the name of the business process, lack of names of data streams, complete lack of decomposition of data stores at some levels, incorrect from the point of view of the methodology of the location of interface arcs according to the DEF0 standard, etc.) .

RECOMMENDED LITERATURE

Main

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Information resources

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