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

ЗАТВЕРДЖЕНО
на засіданні кафедри
інформаційних систем.
Протокол № 1 від 22.08.2023 р.

ПОГОДЖЕНО
Проректор з навчально-методичної роботи

_____ Каріна НЕМАШКАЛО

УПРАВЛІННЯ ІТ-ПРОЕКТАМИ

робоча програма навчальної дисципліни (РПНД)

Галузь знань	**12 "Інженерія програмного забезпечення"**
Спеціальність	**121 "Інженерія програмного забезпечення"**
Освітній рівень	**перший (бакалаврський)**
Освітня програма	**"Інженерія програмного забезпечення"**

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

Розробник:
к.е.н., доцент   підписано КЕП   Юлія ЧИРВА

Завідувач кафедри
інформаційних систем   _____   Дмитро БОНДАРЕНКО

Гарант програми   _____   Олег ФРОЛОВ

Харків
2024

APPROVED
at the meeting of the Information Systems
Department
Protocol № 1 of 22.08.2023

AGREED
Vice-rector for educational and methodical
work

№0207 211

_____Karina NEMASHKALO

MANAGEMENT OF IT PROJECTS
Program of the course

Field of knowledge	**12 "Information technologies"**
Specialty	**121 "Software engineering"**
Study cycle	**first (bachelor)**
Study programme	**"Software engineering"**

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

Developers:
PhD, Associate
Professor   digital signature   Yuliia
                                                                    CHYRVA

Head of
Information
Systems   _____   Dmytro
Department   BONDARENKO

Head of study programme   _____   Oleg FROLOV

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, the problem of effective management of software development projects (IT projects) is becoming increasingly acute.

The relevance and necessity of studying the course is determined both by the processes of Ukraine's integration into the world community and by the need for further development of the information society. There is an acute shortage of formalization, preparation and project management skills among professional personnel.

The practical orientation of the course "Management of IT Project" is determined by the urgent need to master the global experience of development, analysis, implementation and project management in the field of information systems and software development.

The goal of the course "Management of IT Project" is to provide students with theoretical knowledge and practical skills in the methodology of IT project management, in particular, in the role of members of project teams in the conditions of active development of the industry in Ukraine.

The tasks of the course are:
- familiarization with the history and development trends of the modern theory of project management;
- familiarization with the properties and types of IT projects on various grounds;
- study of phases and processes of IT project management;
- research of SADT functional modeling methodology (IDEF0 standard) and sequential process execution methodology (IDEF3 standard);
- familiarization with international software development standards;
- mastering approaches to team management, communications, content, deadlines, risks, resources, and project cost;
- mastering the principles and values of Agile methodology;
- mastering Scrum as an IS management methodology for acquiring teamwork skills.

The subject of the course is methodologies and principles of IT project management.

The object of the course is the process of managing IT projects.

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

Table 1

Learning outcomes and competencies formed by the course

Learning outcomes	Competencies
LO 03	GC 7, SC 11, SC 12
LO 06	GC 1, SC 10, SC 11
LO 16	GC 3, GC 7, GC 8, GC 10, SC 12, SC 15

Learning outcomes	Competencies
LO 22	GC 3, GC 7, GC 10, SC 11

where LO 03. Know the main processes, phases and iterations of the software life cycle.

LO 06. The ability to choose and use the software development methodology appropriate to the task.

LO 16. Have skills in team development, approval, design and release of all types of software documentation.

LO 22. Know and be able to apply project management methods and tools.

GC 01. Ability to abstract thinking, analysis and synthesis.

GC 03. Ability to communicate in the national language both orally and in writing.

GC 07. Ability to work in a team.

GC 08. Ability to act on the basis of ethical considerations.

GC 10. The ability to act socially responsibly and consciously.

SC 10. The ability to accumulate, process and systematize professional knowledge regarding the creation and maintenance of software and the recognition of the importance of lifelong learning.

SC 11. Ability to implement phases and iterations of the life cycle of software systems and information technologies based on relevant models and software development approaches.

SC 12. Ability to carry out the system integration process, apply change management standards and procedures to maintain the integrity, overall functionality and reliability of the software.

SC 15. Ability to use technologies and means of distributed data processing and parallel computing in software development.

COURSE CONTENT

Content module 1. Theoretical foundations and methodological support of IT project management

Topic 1. General provisions of software development project management software

1.1. The essence of project management. Main features of projects.

1.2. Fields of knowledge and basic processes of project management.

1.3. The essence, features and classification of IT projects.

1.4. Project implementation planning. Hierarchical work structure (WBS).

1.5. IT project management.

Topic 2. Life cycle of the project

2.1. Phases of the life cycle of an IT project.

2.2. Project life cycle processes.

Topic 3. Modeling of business processes

3.1. Basic principles of modeling business processes.

3.2. SADT functional modeling methodology (IDEF0 standard).

3.3. Methodology of sequential execution of processes (IDEF3 standard).

3.4. DFD data flow diagram modeling methodology.

Topic 4. International project management standards. Basics of PMBOK

4.1. A variety of project management standards.

4.2. Value Delivery System and Project Delivery Principles.

4.3. PMBOK portfolios, programs and projects.

Content module 2 Practical aspects of IT project management. Agile methodology

Topic 5. Project management based on the MSF standard. Project team and quality management

5.1. MSF as a Microsoft approach to project management.

5.2. Structure of the MSF.

5.3. Management of the team and communications in the project.

5.4. IT project quality management.

Topic 6. Justification of the organizational management structure and evaluation of the project's effectiveness

6.1. Organizational structure of project management: main types and basic principles of creation.

6.2. Peculiarities of forming project teams.

6.3. Justification of the feasibility of the project.

6.4. Content of project analysis and assessment of project effectiveness.

Topic 7. Management of the content, terms and risks of the project

7.1. Project planning process and its content.

7.2. Estimating the duration of operations and drawing up a plan execution schedule.

7.3. Identification and assessment of IT project risks, development of measures, response.

Topic 8. Project resource and cost management

8.1. Project resource management.

8.2. Cost classification and IT project cost management.

Topic 9. Agile project management methodology

9.1. Agile methodology: principles and values.

9.2. Extreme programming method in Agile methodology.

9.3. The Crystal method for organizing teamwork in IT projects.

Topic 10. Scrum: team and processes, meetings and artifacts

10.1. Scrum as an IS management methodology based on time management principles.

10.2. The structure of SCRUM.

10.3. Scrum team, main roles in the team.

10.4. Product Backlog and Sprint Backlog.

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

Table 2

List of laboratory studies

Topic name	Content
Topic 1 Laboratory work 1.	Structural and calendar planning of the project
Topic 2. Laboratory work 2.	Drafting a brief for software development software
Topic 3 Laboratory work 3.	Construction of a context diagram of the subject area
Topic 4.	Development of the contract and technical task for the creation

Laboratory work 4.	of the site
Topic 5. Laboratory work 5.	Defining the Vision and Scope of the project. Development of a detailed project plan and determination of labor intensity
Topic 6, Topic 7, Topic 8 Laboratory work 6.	Project development and management using MS Project
Topic 9, Topic 10 Laboratory work 7.	Project development according to the SCRUM methodology

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

Table 3

List of self-studies

Name of the topic and/or task	Content
Topic 1	Processing of lecture material. Acquaintance with the features of Project Manager work in IT. Preparation for laboratory work.
Topic 2	Processing of lecture material. Study of the life cycle of an IT project and the processes that take place in it. Preparation for laboratory work.
Topic 3	Processing of lecture material. Study of the methodology of functional modeling. Preparation for laboratory work.
Topic 4	Processing of lecture material. The study of international and domestic experience in the development of contracts and technical tasks for the creation of a website. Preparation for laboratory work.
Topic 5	Processing of lecture material. Defining the roles of the members of the software development group and managing the project according to the MSF. Preparation for laboratory work.
Topic 6	Processing of lecture material. Study of types of organizational structures of the company and methodical approaches to evaluating the efficiency of their functioning. Preparation for practical training.
Topic 7	Processing of lecture material. Study of methods of reducing the risk of implementation of projects in the field of IT. Preparation for laboratory work.
Topic 8	Processing of lecture material. Study of methodical approaches to estimating the cost of projects in the IT industry. Preparation for laboratory work.
Topic 9	Processing of lecture material. Studying the method of developing dynamic systems (DSDM), functionally oriented development (Feature Driven Development), an iterative approach without functional specifications (Getting Real) and an iterative-incremental software development method (OpenUP). Preparation for laboratory work.
Topic 10	Processing of lecture material. Acquisition of teamwork skills. Preparation for laboratory work. Preparation for the exam.

The number of hours of lecture and laboratory studies and hours of self-study is given in the technological card of the course.

TEACHING METHODS

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

Verbal (lecture (Topic 1-6, 8-10), problem lecture (Topic 7).

Visual (demonstration (Topic 1-10).

Laboratory work (Topic 1 - 10), case method (Topic 1 - 10).

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 and laboratory classes and is aimed at checking the level of preparedness of the higher education applicant to perform specific work and is evaluated by the sum 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 carried out in the form of a semester exam.

The final grade in the course is determined:

`– for the course 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 practical and laboratory works (50 points), 2 written control works (10 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 exam card and assessment criteria.

An example of an examination ticket

Simon Kuznets Kharkiv National University of Economics
First (bachelor's) study cycle
Specialty "Software engineering"
Study program "Software Engineering"
Semester V
The course " Management of IT Project "

EXAMINATION TICKET № 1

I. Stereotype (test) task, table 4.

Table 4

1	General characteristics of projects 1) focus on achieving specific goals. 2) limited duration. 3) inimitability and uniqueness. 4) all answers are correct.
2	By duration, IT projects are divided into 1) simple, medium and complex. 2) short-term, medium-term and long-term. 3) small, medium, large. 4) large, significant, very significant.

3	The sequence of phases of the project necessary to achieve certain goals from the moment of the formation of the project concept to its completion, including the processes of implementation and use of this 1) IT project phases. 2) project life cycle.
4	The main works necessary to achieve the project's goals are carried out in stages 1) conceptual phase. 2) development phase. 3) implementation phase. 4) completion phase.
5	What are the goals of interaction with project stakeholders 1) blocking stakeholders holding back the project. 2) satisfaction of all expectations of interested parties. 3) minimization of resistance to project implementation. 4) minimization of project support.
6	A working product is more important than comprehensive documentation in 1) Agile methodologies. 2) Waterfall methodology.
7	What life cycle model is appropriate to use when creating simple information systems 1) iterative. 2) spiral. 3) incremental. 4) cascade.
8	Initiation, development, execution, control, completion - that's it 1) subjects of IT project management. 2) objects of IT project management. 3) IT project management processes. 4) IT project management methods.
9	What are the types of organizational structures? 1) the customer is the contractor; 2) functional, matrix, design; 3) manager – a single group of project participants; 4) manager - various groups of project participants.
10	The MSF life cycle model combines 1) the flexibility of the cascade model and the simplicity of the spiral. 2) ease of management of the cascade model with the flexibility of the spiral model. 3) the advantages of extreme programming and the simplicity of the spiral model. 4) limitations of extreme programming and simplicity of the spiral model.
11	The main phases of the MSF model are: 1) creating a general picture of applications (Envisioning) and planning (Planning). 2) development (Developing). 3) stabilization (Stabilizing) and deployment (Deploying). 4) all answers are correct.
12	Assessment of the existing situation, determination of team composition, project structure, business goals, requirements and user profiles; development of the solution concept and risk assessment according to the MSF standard is in progress 1) creating a general picture of applications (Envisioning). 2) planning (Planning). 3) development (Developing). 4) stabilization (Stabilizing).
13	Triangle of priorities according to the MSF standard 1) resources, time, opportunities.

	2) staff, product, project.
	3) requirements, functions, architecture.
	4) code, architecture, requirements.
14	The main principle of the project group is the MSF standard
	1) fairly distribute tasks between performers.
	2) to understand the specifics of the customer's business.
	3) to develop modern technical documentation in a timely manner.
	4) release the right product at the right time.
15	A system of methods and types of activities aimed at fulfilling the requirements and expectations of the customer and consumers of the project product regarding the quality of the project itself and its products is
	1) managing project deadlines.
	2) project team management.
	3) project planning management.
	4) project quality management.
16	The process that involves determining the goals and parameters of interaction between works and project participants, resource allocation and selection and decision-making to achieve the project goals is
	1) IT project planning process.
	2) IT project management process.
	3) team building process.
	4) risk management process.
17	The development of one of the functions of the software product being created for subjective reasons required more costs than the expert had previously estimated - this is a risk associated with
	1) sometimes.
	2) budget.
	3) technology.
	4)quality.
18	Determining what resources and in what quantity will be used in the project works is
	1) resource planning.
	2) assessment of the need for resources.
	3) drawing up a table of resource needs for works.
	4) compilation of the resource availability table.
19	Violation of the terms of contracts for the supply of project product components is a risk associated with
	1) the market.
	2) scientific and technological progress.
	3) counterparties.
	4) sometimes.
20	Investment and current expenses are distinguished according to the following criteria:
	1) the degree of influence of the volume of production on the level of costs.
	2) at the place of work.
	3) by methods of inclusion in the cost of project works.
	4) on the basis of the relation to the cost of works.
21	What is the key advantage of Agile compared to the waterfall approach (Waterfall)
	1) in Agile, everyone works as a single team and therefore there are fewer communication problems.
	2) in Agile, the cost of development is reduced due to increased efficiency.
	3) agile allows you to reduce the cost of errors that inevitably occur in complex environments.
	4) Agile has less idle resources.

22	What is the sprint backlog 1) a board with three columns - To Do, In Work, Done - and with task cards placed on it. 2) a list of tasks that developers need to complete in order to implement a product increment. 3) the sprint goal, the set of product backlog items selected for implementation within the sprint, and the plan for their implementation in the product increment. 4) a list of prerequisites for sprint execution.
23	A methodology that involves product development as a flow that successively passes through the phases of requirements analysis, design, implementation, testing, integration and support 1) cascade development methodology. 2) flexible development methodology.
24	What is the key advantage of Agile compared to the waterfall approach (Waterfall) 1) in Agile, everyone works as a team and therefore there are fewer communication problems. 2) in Agile, the cost of development is reduced due to increased productivity. 3) Agile allows you to reduce the cost of errors that inevitably occur in complex environments. 4) in Agile there is less downtime of resources.
25	And why is Scrum intended? 1) increase the efficiency of product management and improve development practices. 2) establish strict rules on the project that everyone must follow.
26	What is the recommended number of team members for a Scrum team 1) 2-4. 2) 3-9. 3) 10-15. 4) 20-50.
27	What duties are included in the role of a Scrum Master 1) explain Scrum values and practices to team members and monitor their adherence. 2) perform the duties of the technical team leader. 3) to be a representative of the development team at meetings with the Product Owner.
28	Which role does not exist in the Scrum methodology 1) product owner 2) Scrum master. 3) project manager. 4) the tester

II. Heuristic tasks

How a PM will plan a software product development project, namely a CRM system, using Zoho.

1. Familiarity with business

1.1. Collection of information about the industry, target market and business processes of the customer enterprise - 5 days.

1.2 Conducting interviews with future users of the system: managers, marketers and sales managers - 2 days.

1.3. The brief has been drawn up.

2. Designing and setting tasks

2.1. Analysis of the data obtained at the first stage – 3 days.

2.2. Identifying business problems and finding ways to solve them - 4 days.

2.3. Compiling a list of priority tasks - 3 days.

2.4. The terms of reference have been approved, the project team has been appointed.

3.Prototype and design creation

3.1. Creation of mockups of the CRM interface and presentation to the customer - 6 days.

3.2. Adjustment of the prototype according to wishes - 1 day.

3.3. The final version of the design has been approved.

4.Development and testing

4.1. Development of the server part of the project - 15 days.

4.2. Development of the client part of the project - 15 days.

4.3. Testing is 7 days.

4.4. The software is developed.

5.Implementation of CRM in business processes

5.1. Transferring the CRM system to the customer's working hosting or equipment - 2 days.

5.2. Synchronization with other enterprise programs - 1 day.

5.3. Connecting mail, IP telephony and other communication channels to the system - 1 day.

5.4. Staff training – 3 days.

5.5. The act of commissioning has been signed.

III. Heuristic tasks

1. Build a Gantt chart.
2. Define the critical path.
3. Sequentially change the status of project tasks.
4. Get the diagram-report of the project.

Approved at a meeting of the Department of Information Systems. Protocol No. _____ of "___"_____20___year.

Examiner, Doctor of Economics, Assoc. Yuiia CHYRVA

Head of Department of Ph.D., Assoc. Oleksandr BONDARENKO

Assessment criteria

Each exam ticket for the Management of IT Project exam contains three tasks:

I. Stereotype (test).

II. Heuristic.

III. Heuristic.

The final grade for the exam tasks is the sum of the marks for each task.

The stereotype task is devoted to the solution of a logical-theoretical task according to the main definitions and provisions of the. The main goal is to organize the terminological apparatus of the course according to the materials of the lecture part of the. The form of conducting is test tasks. Each test contains 28 questions. Each question has only one answer option.

The correct answer to each test question is estimated at 0.25 points. The total number of points for the first task is defined as the sum of points for the answers to the test questions and can range from 0 to 14 points.

The second and third heuristic tasks are practical tasks aimed at solving typical professional tasks of an IT project management specialist and allow diagnosing the level of training and competence of the applicant of the course.

The evaluation criteria for the second and third tasks of the exam ticket are as follows:

13 points – for a completely correctly completed task;

10 - 12 points - for a task performed with minor and insignificant errors (for each inaccuracy, the score is reduced by 1 point);

7 - 9 points - if the task is performed correctly in general, but not completely;

1 – 6 points – for a task performed with significant errors (for each error, the grade is reduced by 1 point);

0 points - the task was not completed at all.

RECOMMENDED LITERATURE

Main

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Additional

4. A guide to the project management body of knowledge (PMBOK Guide) – Seventh Editinal An American National Standart. – ANSI/PMI 99-001-2021.

5. Моделювання бізнес-процесів та управління ІТ-проектами : навчальний посібник / Є. М. Крижановський, А.Р. Ящолт, С.О. Жуков, О. М. Козачко – Вінниця : ВНТУ, 2018. – 91 с.

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7. Kirsi Hyttinen Project management handbook. – Laurea, 2017. – 69 p.

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8. Управління ІТ-проектами / Ю.Є. Чирва // Сайт ПНС ХНЕУ ім. С.Кузнеця [Електронний ресурс]. – Режим доступу: https://pns.hneu.edu.ua/course/view.php?id=8546

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10. Project management [Electronic resource]. – URL : https://www.opentextbooks.org.hk/system/files/export/15/15694/pdf/Project_Management_15694.pdf