Syllabus
Course Program

Project (practice)

Specialty
121 – Software Engineering

Institute
Institute of Computer Science and Information Technology

Educational program
Software Engineering

Department
Software Engineering and Management Intelligent Technologies (321)

Level of education
Bachelor's level

Course type
Special (professional), Elective

Semester
6

Language of instruction
English, Ukrainian

Lecturers and course developers

Iryna Liutenko

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Candidate of Technical Sciences (PhD), Associate Professor, Associate Professor of the Department of Software Engineering and Management Intelligent Technologies of NTU "KhPI"

Prepared and published more than 60 publications, 1 collective monograph, 1 textbook with the university stamp, 3 articles in publications indexed in Scopus (Google Scholar: https://scholar.google.com/citations?user=9EhcsRcAAAAJ; ORCID: https://orcid.org/0000-0003-4357-1826).
More about the lecturer on the department's website

Mariia Bilova

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Prepared and published more than 50 publications (Google Scholar: https://scholar.google.com/citations?user=b3YLGToAAAAJ; ORCID- https://orcid.org/0000-0001-7002-4698; Scopus https://www.scopus.com/authid/detail.uri?authorId=57190442390).
More about the lecturer on the department's website

General information

Summary

Project practice is a part of the educational process and is conducted in the 3rd year of study in the 6th semester for full-time students. The duration of the practice is 180 hours (6 credits). Project practice is aimed at familiarizing students with the main forms of activity in the specialty 121 "Software Engineering".

The project practice takes place at the Department of Software Engineering and Management Intelligent Technologies and the Innovation Campus training laboratory of the National Technical University "Kharkiv Polytechnic Institute".

Course objectives and goals

Formation of practical skills in team development of a software project, taking into account all stages of its life cycle.

Format of classes

Independent work. The final control is a test.

Competencies

К01. Ability to think abstractly, analyze and synthesize.
К02. Ability to apply knowledge in practical situations.
К04. Ability to communicate in a foreign language both orally and in writing.
К05. Ability to learn and master modern knowledge.
К06. Ability to search, process and analyze information from various sources.
К07. Ability to work in a team.
К10. Ability to act in a socially responsible and conscious manner.
К13. Ability to identify, classify and formulate software requirements.
К14. Ability to participate in software design, including modeling (formal description) of its structure, behavior and processes of functioning.
К15. Ability to develop architectures, modules and components of software systems.
К16. Ability to formulate and ensure software quality requirements in accordance with customer requirements, terms of reference and standards.
К17. Ability to comply with specifications, standards, rules and guidelines in the professional field when implementing life cycle processes.
К18. Ability to analyze, select and apply methods and tools to ensure information security (including cybersecurity).
К19. Knowledge of data information models, ability to create software for storing, extracting and processing data.
К22. Ability to accumulate, process and systematize professional knowledge of software development and maintenance and recognize the importance of lifelong learning.
К23. Ability to implement phases and iterations of the life cycle of software systems and information technologies based on appropriate software development models and approaches.
К24. 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.
К25. Ability to reasonably choose and master the tools for software development and maintenance.
К26. Ability to think algorithmically and logically.

Learning outcomes

PLO01. Analyze, purposefully search and select information and reference resources and knowledge necessary for solving professional problems, taking into account modern achievements of science and technology.
PLO02. To know the code of professional ethics, to understand the social significance and cultural aspects of software engineering and to adhere to them in professional activities.
PLO03. Know the basic processes, phases and iterations of the software life cycle.
PLO04. To know and apply professional standards and other regulatory documents in the field of software engineering.
PLO06. Ability to select and use a software development methodology appropriate to the task.
PLO07. To know and apply in practice the fundamental concepts, paradigms and basic principles of functioning of language, tools and computing tools of software engineering.
PLO08. Be able to develop a human-machine interface.
PLO09. To know and be able to use methods and tools for collecting, formulating and analyzing software requirements.

PLO10. Conduct a pre-project survey of the subject area, system analysis of the design object.
PLO11. Select input data for design, guided by formal methods of requirements description and modeling.
PLO13. Know and apply methods of developing algorithms, designing software and data structures and knowledge.
PLO14. Apply in practice software tools for domain analysis, design, testing, visualization, measurement and documentation of software.
PLO15. Motivated to choose programming languages and development technologies to solve the problems of creating and maintaining software.
PLO16. Have the skills of team development, coordination, design and production of all types of program documentation.
PLO17. Be able to apply methods of component software development.
PLO18. To know and be able to apply information technologies for data processing, storage and transmission.
PLO19. To know and be able to apply methods of software verification and validation.
PLO20. Know approaches to assessing and ensuring software quality
PLO21. To know, analyze, select, and competently apply means of ensuring information security (including cybersecurity) and data integrity in accordance with the applied tasks and software systems being created.
PLO22. To know and be able to apply project management methods and tools.
PLO23. Be able to document and present the results of software development.

Student workload

The total volume of the course is 180 hours (6 ECTS credits): self-study - 180 hours.

Course prerequisites

Students must complete the required general and professional training courses in 1-5 semesters of study in full.

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

The practice involves the independent work of higher education students in groups of 3-6 people in accordance with the main provisions of the Challenge Based Learning framework and the concept of peer-to-peer learning. In the process, students need to go through all stages of software development from the formation of a business idea to the presentation of the finished product to end users.
Students plan their working hours independently during the 6th semester, taking into account the wishes of the internship supervisor.

Program of the course

Topics of the lectures

Lectures are not provided as part of the practice.

Topics of the workshops

Workshops are not provided as part of the practice.

Topics of the laboratory classes

Laboratory classes are not provided as part of the practice.

Self-study

During the internship, students must:
- fully fulfill the tasks provided by the internship program;
- study and comply with the rules of labor protection, safety and industrial sanitation;
- participate in the social life of the Department of Software Engineering and Management Intelligent Technologies and the Innovative Campus training laboratory;

- be responsible for the work performed on an equal footing with all students participating in the internship.

Course materials and recommended reading

Training materials and assignments are provided by the supervisors of the internship.

Assessment and grading

Criteria for assessment of student performance, and the final score structure

The main assessment measures are:
- presentation of the developed software to the commission formed from the staff of the department and/or the training laboratory "Innovative Campus" and other higher education students who are undergoing internships;
- review of the project practice report and the practice diary by the practice supervisor and the commission.

The project practice report must contain
- a description of the business idea chosen as the basis for the software project;
- description of the main stages of software design;
- a description of the architecture, functionality, and features of the developed software;
- description of the results of the developed software;
- description of the main opportunities for improving the project and ways of its further monetization.

The main stages of work on the tasks of the internship must be properly presented in the internship diary.
The defense of the internship takes place at the department or in the Innovation Campus training laboratory.

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

The student 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	08.06.2023	Head of the department Ihor HAMAIUN
	08.06.2023	Guarantor of the educational program Uliya LITVINOVA