**Syllabus**
Course Program

# Fundamentals of Software Project Management

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), Mandatory

Semester
8

Language of instruction
English, Ukrainian

## Lecturers and course developers

**Maryna Vovk**
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Google Scholar: https://scholar.google.com/citations?hl=ru&user=YEmGWLkAAAAJ&view_op=list_works&sortby=pubdate
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Scopus: https://www.scopus.com/authid/detail.uri?authorId=57203517746
Web of Science: https://www.webofscience.com/wos/author/record/T-7377-2018
More about the lecturer on the department's website

## General information

### Summary

The objective of the discipline is to acquire knowledge and skills necessary for project planning and implementation; selection of sources of financing for the implementation of the project; ensuring maximum profitability of projects; creating a project team and establishing effective communication.

### Course objectives and goals

Formation of students' theoretical and practical knowledge necessary for working with projects, to give an idea of modern project management technology and to acquaint students with the principles of using project management in the tasks of their future professional activity.

### Format of classes

Lectures, laboratory classes, self-study, consultations. Final control in the form of an exam.

### Competencies

K02. Ability to apply knowledge in practical situations.
K05. Ability to learn and master modern knowledge.
K06. Ability to search, process and analyze information from various sources.

К07. Ability to work in a team.
К17. Ability to comply with specifications, standards, rules and guidelines in the professional field when implementing life cycle processes.
К20. Ability to apply fundamental and interdisciplinary knowledge to successfully solve software engineering problems.
К21. Ability to evaluate and take into account economic, social, technological and environmental factors that affect the field of professional activity.
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.

### 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.
PLO03. Know the basic processes, phases and iterations of the software life cycle.
PLO16. Have the skills of team development, coordination, design and production of all types of program documentation.
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.
PLO24. Be able to calculate the economic efficiency of software systems.

### Student workload

The total volume of the course is 90 hours (3 ECTS credits): lectures – 20 hours, laboratory classes – 20 hours, self-study – 50 hours.

### Course prerequisites

Software requirements engineering
Software architecture and design

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

Teaching and learning methods:
interactive lectures with presentations, discussions, laboratory classes, teamwork, case method, student feedback, problem-based learning.
Forms of assessment:
written individual assignments for laboratory work (CAS), assessment of knowledge in laboratory classes (CAS), express surveys (CAS), online tests (CAS), final/semester control in the form of a semester exam, according to the schedule of the educational process (FAS).

## Program of the course

### Topics of the lectures

Topic 1: Introduction to project management
Concept of project and project management. The history and evolution of the formation of project management methodologies. Characteristics and main groups of requirements. Requirements management process. Requirement's detection methods. Problems that arise when requirements are identified. Requirement's analysis. Documentation of requirements. Checking requirements. Management of requirements changes. Requirements management software.
Topic 2. Project life cycle. Project organization according to PMBoK methodology
Project life cycle model. The main components of the initialization process. Planning levels. Definition of project works. Procedures for organizing project implementation. Performance reports. Requirements for the control system. Study of the main points that need monitoring. Actions to complete the project. Project audit. External and internal environment of the project.
Topic 3. Initialization and Planning processes
Project life cycle. Fields of knowledge. Five groups of management processes. The main limitations of the project. Development of a project management plan. Estimate duration and resources. Project cost

estimate. Establishing quality standards. Establishing communication. Identification of risks and procurement planning. Change planning.

Topic 4. Execution, Monitoring and control, Completion processes

Procedures for organizing project implementation. Performance reports. Monitoring and control of execution. Quality audit and continuous improvement. Integration processes for PM. Integrated change control. The final stage and obtaining the right of transfer. Project closure and reflection.

Topic 5. Agile technologies in project management. SCRUM

The main features of flexible management technologies. Principles and features of implementation approaches.

Topic 6. Group dynamics and social communications

Stages of team formation: unification, disagreements and conflicts, formation, return. Disbanding of the team. Indicators of effective team activity. Factors of employee immaturity. Skills of an effective programmer. Professional and unprofessional behavior in the team. Effective time management. Virtual teams, features of interaction. Communication.

### Topics of the workshops

Workshops are not provided within the discipline.

### Topics of the laboratory classes

Topic 1. Analysis of the subject area. Problem analysis: building a problem tree. Building a tree of goals.
Topic 2. Development of the Project Charter. Scope of the project.
Topic 3. Development of communication policy.
Topic 4. Develop a Product Backlog.
Topic 5. User interface design, prototype development

### Self-study

Individual assignments are not provided in the curriculum.
Students are recommended with additional materials (videos, articles) for self-study and processing.

## Course materials and recommended reading

### Key literature

1. A Guide to the Project Management Body of Knowledge (PMBOK® Guide) – Seventh Edition and The Standard for Project Management (ENGLISH) Seventh edition, Kindle Edition, 2021
2. Agile Practice Guide Kindle Edition, 210 pages, 2017
3. E. SAFe 5.0 Distilled: Achieving Business Agility with the Scaled Agile Framework 9780136820406 Report DMCA / Copyright 2020
4. G. Agile Transformation: Using the Integral Agile Transformation Framework™ to Think and Lead Differently [1 ed.] Report DMCA / Copyright 2020
5. Succeeding with Agile Hybrids: Project Delivery Using Hybrid Methodologies [1st ed.] Pages XI, 157 [156] Year 2020

### Additional literature

1. Doing Agile Right: Transformation Without by Darrell Rigby, Sarah Elk, Steve Berez Chaos Hardcover – Illustrated, May 26, 2020
2. The Startup Owner's Manual: The Step-By-Step Guide for Building a Great Company by Steve Blank and Bob Dorf | Mar 17, 2020
3. Hohl P, Klünder J, van Bennekum A. Back to the future: origins and directions of the “Agile Manifesto”—views of the originators. J Softw Eng Res Dev. 2018;6(1):15. doi:10.1186/s40411-018-0059-z
4. Klünder J, Horstmann J, Karras O. Identifying the Mood of a Software Development Team by Analyzing Text-Based Communication in Chats with Machine Learning: Springer; 2020;133-151.

## Assessment and grading

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

100% of the final grade consists of the results of the assessment in the form of an exam (40%) and current assessment (60%):
- 6 laboratory works (6% each);
- 2 tests (12% each).

### 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

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|---|---|---|
| Approved by | 08.06.2023 | Head of the department<br>Ihor HAMAIUN |
| | 08.06.2023 | Guarantor of the educational program<br>Uliya LITVINOVA |