Ministry of Education and Science of Ukraine
National Technical University
"Dnipro Polytechnic"

Department of Systems Analysis and Management

"APPROVED"
head of department
Zheldak T.A. _____
"1" December 2025

WORK PROGRAM OF THE ACADEMIC DISCIPLINE
" Project Portfolio Management "

Field of knowledge ……	F Information Technology
Educational level…….	Doctor of Philosophy
Status……	selective
Total volume ..…….	4 ECTS credits (1 2 0 hours)
Final control form ……..	differentiated credit
Teaching period ……..	4th semester
Language of instruction …….	Ukrainian, English

Lecturer: Doctor of Technical Sciences, Professor of the Department of Civil Engineering Valentina MOLOKANOVA

Extended: for 20__/20__ n.y. _____(_____) «__»___ 20__y.
(signature, full name, date)

on 20__/ 20__ AD _____(_____) "__"___ 20__yr.
(signature, full name, date)

Dnipro
NTU "DP"
2025

Working program of the academic discipline " **Project Portfolio Management** " for higher education applicants in the field of knowledge F "Information Technologies" / National Technical University "Dnipropetrovsk Polytechnic", Department of Computer Science. - D.: NTU "DP", 2025. - 14 p.

Developer: Doctor of Technical Sciences, Professor of the Department of Civil Engineering Valentina MOLOKANOVA

The work program regulates:

–the purpose of the discipline;
–disciplinary learning outcomes formed on the basis of the transformation of the expected learning outcomes of the educational program;
–basic disciplines;
–volume and distribution by forms of organization of the educational process and types of educational activities;
–discipline program (thematic plan by types of educational activities);
–algorithm for assessing the level of achievement of disciplinary learning outcomes (scales, tools, procedures and assessment criteria);
–tools, equipment and software;
–recommended sources of information.

CONTENT

1 PURPOSE OF THE ACADEMIC DISCIPLINE

Purpose of the discipline. Project management methodology studies three levels of management activity: project level, program level and portfolio level. In mature organizations, project management exists at a higher level in the form of project portfolio management. But according to the American Center for Business Research, project portfolio management is still at a very low level in the vast majority of companies. This is not surprising, considering the fact that organizations began to implement project portfolio management only a few years ago and the portfolio management methodology is constantly developing. At the same time, only 15% of companies use special software tools for portfolio management. However, despite the relatively low level of development of portfolio management, the vast majority of organizations consider this area to be one of the key ones for gaining competitive advantages.

The purpose of the academic discipline is to form in future scientists a systemic understanding of the project portfolio as a means of implementing systemic changes at the tactical level of organizational development and to study the specifics of the professional activities of project portfolio management specialists.

2 EXPECTED DISCIPLINARY LEARNING OUTCOMES

DLO 1	Acquire the ability to initiate, develop and manage project portfolios in the field of information technology, related industries and related interdisciplinary areas.
DLO 2	Be able to analyze and structure organizational problems, make management decisions, and ensure the conditions for their implementation through the use of modern management technologies.
DLO 3	Acquire the ability to determine priorities, promote the implementation of innovations, develop and implement appropriate innovation and investment portfolios of projects in the business sector and in the field of information technology.
DLO 4	Use modern software products in practical activities to manage project portfolios, assess the success and efficiency of management processes by applying value - oriented approaches.

3 BASIC DISCIPLINES

The study of the course is based on the knowledge gained from the disciplines studied at the previous level of education.

4 VOLUME AND DISTRIBUTION BY FORMS OF ORGANIZATION OF THE EDUCATIONAL PROCESS AND TYPES OF TRAINING CLASSES

Type of training sessions	Amount, hours	**Distribution by form of study** , *hours*			
		daytime		**correspondence**	
		classroom lessons	independent work	classroom lessons	independent work
lecture	60	21	39	6	54
practical	60	14	46	6	54
laboratory	-	-	-	-	-
TOGETHER	**120**	**35**	**85**	**12**	**108**

5 DISCIPLINE PROGRAM BY TYPES OF EDUCATIONAL CLASSES

Ciphers DLO	**Types and topics of training sessions**	**Volume of components,** *hours*
	LECTURES	**60**
DLO 1	**Topic 1. Purpose, objectives, object and subject of research of the discipline. Basic terms and specific features of portfolio management.** Object and subject of study of the discipline. Classification of project levels Management. Programs, portfolios and innovations. Strategy and portfolio of development projects. Types of relationships between projects and programs in the portfolio. Integration and organizational platform. Portfolio life cycle.	8
DLO 1 DLO 2 DLO 4	**Topic 2. Organizational platform for managing programs and project portfolios.** Project-oriented system. Organizational development through programs and project portfolios. Integration and organizational platform. Project office. The place of the project office in managing programs and project portfolios. Mental space of project management.	8
DLO 1 DLO 3	**Topic 3. Project-oriented financial management.** Fundamentals of project-oriented financial management. Basic concepts of financial design of portfolios, programs and projects. Principles and methods of forming project funds. Provision and security of project funds.	8
DLO 2 DLO 3 DLO 4	**Topic 4. General provisions on program management**. Program and corporate strategy. Program and its place in the project portfolio. Development of program architecture. Management by objectives and management by results. Scheme of general program optimization. Systems engineering in program management. Basic methods of program performance assessment.	8
DLO 1 DLO 2 DLO 3	**Topic 5. General provisions on project portfolio management**. Practical aspects of the system approach in project portfolio management. Soft and hard system approaches in program and portfolio management. Portfolio formation models. Project portfolio	8

Ciphers DLO	Types and topics of training sessions	Volume of components, *hours*
	management processes. Systems engineering in project portfolio management.	
DLO 1 DLO 2 DLO 3	**Topic 6. Basic concepts of organizational development management through projects.** Strategy and portfolio of organization development. Types of project relationships in the portfolio. Strategy development at the tactical level. Management by objectives and management by results. System of balanced scorecards of the organization. Basic methods of assessing the performance of the project portfolio.	8
DLO 1 DLO 2 DLO 3	**Topic 7. Community Integration and Management**. Community Integration and Management. Integration Management Framework at Portfolio, Program and Project Levels. Human Resources Platform. Cultural Platform of Project-Oriented Management. Information Platform of Project-Oriented Management and Application of Software Products.	6
DLO 1 DLO 2 DLO 3 DLO 4	**Topic 8. Value-based management**. General concepts of value-based management. Models of assessing the values of a project organization. Sources of corporate values. Basic approaches to creating and delivering values. Environment and conditions for creating values.	6
	PRACTICAL CLASSES	**60**
DLO 1 DLO 2 DLO 4	**Practical work No. 1** **Topic: Formulating the mission, strategy, goals and priorities of a project-oriented organization.** Objective: to consolidate theoretical knowledge of the portfolio management methodology, develop practical skills in managing the processes of forming project portfolios in accordance with the organization's strategy.	12
DLO 1 DLO 2 DLO 3	**Practical work No. 2** **Topic: Portfolio, Program and Individual Project Architecture**. Objective: to consolidate theoretical knowledge and develop the ability to practically apply the guidelines of international and national project management standards to ensure sustainable development of complex systems through project portfolios. To develop and present the portfolio and program architecture according to PMI standards.	12
DLO 1 DLO 2 DLO 3	**Practical work No. 3** **Topic: Key characteristics and success indicators of project portfolios.** Objective: to consolidate theoretical knowledge and develop practical skills in the application of modern information technologies in the field of project, program and portfolio management. To learn how to select criteria for ranking specific projects/programs before including them in the project portfolio.	12
DLO 1 DLO 2 DLO 3	**Practical work No. 4** **Topic: Formation of a portfolio of competing projects.**	12

Ciphers DLO	Types and topics of training sessions	Volume of components, *hours*
	Goal: to consolidate theoretical knowledge and develop practical skills in forming a portfolio of competing projects using modern software products.	
DLO 1 DLO 2 DLO 3 DLO 4	**Practical work No. 5** **Topic: Forming a portfolio of projects taking into account additional benefits** Goal: to consolidate theoretical knowledge and develop practical skills in forming a project portfolio, taking into account additional benefits from the use of modern software products.	12
	TOGETHER	**120**

6 ASSESSMENT OF LEARNING OUTCOMES

Assessment and certification of applicants' achievements is carried out using transparent procedures based on objective criteria in accordance with the University Regulations " On the Assessment of Learning Outcomes of Applicants for Higher Education". The achieved level of competencies relative to the expected ones, identified during control measures, reflects the real learning outcome of the applicant for higher education in the discipline.

6.1 Scales

The assessment of academic achievements of NTU "DP" applicants is carried out using rating (100-point) and conversion scales. The latter is necessary (due to the official absence of a national scale) for converting (translating) the grades of applicants for higher education from different institutions.

Scales for assessing academic achievements of applicants to NTU "DP"

Rating	Institutional
90…100	Excellent
74…89	Good
60…73	Satisfactory
0…59	Fail

Academic discipline credits are credited if the applicant receives a final grade of at least 60 points. A lower grade is considered academic debt, which is subject to liquidation in accordance with the Regulations on the Organization of the Educational Process of NTU "DP".

6.2 Tools and procedures

The content of the diagnostic tools is aimed at monitoring the level of formation of the applicant's knowledge, skills, communication, autonomy, and responsibility according to the requirements of the NQF.

During the tests, the applicant must perform tasks focused exclusively on demonstrating disciplinary learning outcomes (section 2).

Diagnostic tools provided to applicants at control events in the form of tasks for current and final control are formed by specifying the initial data and the method of demonstrating disciplinary learning outcomes.

Diagnostic tools (test tasks) for current and final control of the discipline are approved by the department.

Types of diagnostic tools and assessment procedures for current and final control of the discipline are presented below.

Diagnostic tools and assessment procedures

<table>
<tr><th colspan="3">CURRENT CONTROL</th><th colspan="2">FINAL CHECK</th></tr>
<tr><th>training session</th><th>diagnostic tools</th><th>procedures</th><th>diagnostic tools</th><th>procedures</th></tr>
<tr><td>lectures</td><td>test tasks for each topic</td><td>completing assignments during lectures</td><td rowspan="3">comprehensive test (CCT)</td><td rowspan="3">determining the weighted average result of current controls;

performance of KKR during differentiated assessment at the request of the higher education applicant</td></tr>
<tr><td rowspan="2">practical</td><td>test tasks for each topic</td><td>completing tasks during practical classes</td></tr>
<tr><td>or individual task</td><td>completing tasks during independent work</td></tr>
</table>

During the current control, lecture classes are evaluated by determining the quality of performance of specific control tasks. Practical and laboratory classes are evaluated by the quality of performance of a control or individual task.

If the content of a certain type of lesson is subject to several qualification levels , then the integral value of the assessment can be determined taking into account the weighting factors established by the teacher.

If the level of results of current controls for all types of educational activities is at least 60 points, the final control is carried out without the participation of the higher education applicant by determining the weighted average value of current grades.

Regardless of the results of the current control, each higher education applicant has the right to complete the KKR during the exam, which contains tasks covering key disciplinary learning outcomes.

The number of specified tasks of the CCR should correspond to the time allotted for their implementation. The number of CCR options should ensure individualization of the task.

The value of the assessment for the performance of the CQR is determined by the average score of the components (specified tasks) and is final.

The integral value of the assessment of the performance of the KKR can be determined taking into account the weighting factors established by the department for each qualification level of the NQF .

6.3 Criteria

The actual learning outcomes of a higher education student are identified and measured against those expected during assessment activities using criteria that describe the actions of the higher education student to demonstrate achievement of learning outcomes.

To evaluate the performance of control tasks during the ongoing control of lectures and practical classes, the learning coefficient is used as a criterion, which automatically adapts the assessment indicator to the rating scale:

$$\text{About}_i = 100\ a/m\ ,$$

where *a* is the number of correct answers or essential operations performed according to the solution standard; *m* is the total number of questions or essential operations of the standard .

Individual tasks and comprehensive tests are assessed by experts using criteria that characterize the ratio of requirements for the level of competencies and assessment indicators on a rating scale.

The content of the criteria is based on the competence characteristics defined by the NQF for the higher education level (presented below).

General criteria for achieving learning outcomes

Description of qualification level	**Requirements for knowledge, skills, communication, responsibility and autonomy**	**Indicator assessments**
	Knowledge	
♦ specialized conceptual knowledge that includes modern scientific achievements in the field of professional activity or field of knowledge and is the basis for original thinking and conducting research, critical understanding of problems in the	The answer is excellent – correct, well-founded, and meaningful. Characterized by the presence of: – specialized conceptual knowledge at the level of the latest achievements; – critical reflection on problems in education and/or professional activities and at the boundaries of subject areas	95-100
	The answer does not contain any gross errors or typos.	90-94
	The answer is correct, but has some inaccuracies.	85-89
	The answer is correct, but has some inaccuracies and is not sufficiently substantiated.	80-84
	The answer is correct, but has some inaccuracies, is not sufficiently substantiated and meaningful	74-79
	The answer is fragmentary.	70-73

Description of qualification level	Requirements for knowledge, skills, communication, responsibility and autonomy	Indicator assessments
field and at the border of fields of knowledge	The answer demonstrates the applicant's vague ideas about the object of study.	65-69
	The level of knowledge is minimally satisfactory	60-64
	The level of knowledge is unsatisfactory.	<60
	***Skills* /Abilities**	
♦ specialized problem-solving skills required to conduct research and/or implement innovative activities to develop new knowledge and procedures; ♦ the ability to integrate knowledge and solve complex problems in broad or multidisciplinary contexts; ♦ the ability to solve problems in new or unfamiliar environments with incomplete or limited information, taking into account aspects of social and ethical responsibility	The answer characterizes the ability to: – identify problems; – formulate hypotheses; – solve problems; – update knowledge; – integrate knowledge; – to conduct innovative activities; – to conduct scientific activities	95-100
	The answer characterizes the ability/skills to apply knowledge in practical activities without making serious mistakes.	90-94
	The answer characterizes the ability/skills to apply knowledge in practical activities, but has certain inaccuracies in the implementation of one requirement	85-89
	The answer characterizes the ability/skills to apply knowledge in practical activities, but has certain inaccuracies in the implementation of two requirements	80-84
	The answer characterizes the ability/skills to apply knowledge in practical activities, but has certain inaccuracies in the implementation of the three requirements	74-79
	The answer characterizes the ability/skills to apply knowledge in practical activities, but has certain inaccuracies in the implementation of the four requirements	70-73
	The answer characterizes the ability/skills to apply knowledge in practical activities when performing tasks according to the model	65-69
	The answer characterizes the ability /skills to apply knowledge when performing tasks according to the model, but with inaccuracies	60-64
	The level of skills is unsatisfactory.	<60
	Communication	
♦ clear and unambiguous communication of one's own knowledge, conclusions and arguments to specialists and non-specialists, in particular to students	Clarity of the answer (report). *Language:* correct; pure; clear; precise; logical; expressive; concise. *Communication strategy:* – consistent and consistent development of thought; – the presence of logical own judgments; – the relevance of the argument and its correspondence to the defended positions; – correct structure of the answer (report); – correctness of answers to questions; – appropriate question answering techniques; – the ability to draw conclusions and formulate proposals; – use of foreign languages in professional activities	95-100

Description of qualification level	Requirements for knowledge, skills, communication, responsibility and autonomy	Indicator assessments
	Sufficient clarity of the response (report) and appropriate communication strategy with minor errors	90-94
	Good clarity of the answer (report) and appropriate communication strategy (a total of three requirements were not implemented)	85-89
	Good clarity of the response (report) and appropriate communication strategy (a total of four requirements were not implemented)	80-84
	Good clarity of the answer (report) and appropriate communication strategy (a total of five requirements were not implemented)	74-79
	Satisfactory clarity of the response (report) and appropriate communication strategy (a total of seven requirements were not implemented)	70-73
	Satisfactory clarity of the response (report) and communication strategy with errors (a total of nine requirements were not implemented)	65-69
	Satisfactory clarity of the answer (report) and communication strategy with errors (a total of 10 requirements were not implemented)	60-64
	The level of communication is unsatisfactory.	<60
Responsibility and autonomy		
♦ managing work or learning processes that are complex, unpredictable, and require new strategic approaches; ♦ responsibility for contributing to professional knowledge and practice and/or evaluating the performance of teams and collectives; ♦ the ability to continue learning with a high degree of autonomy	Excellent command of the following competencies: – using principles and methods of organizing team activities; – effective distribution of authority within the team structure; – maintaining balanced relationships with team members (responsibility for relationships); – stress resistance ; – self-regulation; – labor activity in extreme situations; – high level of personal attitude to the matter; – mastery of all types of educational activities; – appropriate level of fundamental knowledge; – appropriate level of formation of general educational skills and abilities	95-100
	Confident possession of competencies responsibility and autonomy with minor flaws	90-94
	Good command of the competencies of responsibility and autonomy (two requirements not implemented)	85-89
	Good command of responsibility and autonomy competencies (three requirements not implemented)	80-84
	Good command of responsibility and autonomy competencies (four requirements not implemented)	74-79
	Satisfactory possession of responsibility and autonomy competencies (five requirements not implemented)	70-73
	Satisfactory possession of responsibility and autonomy competencies (six requirements not implemented)	65-69

Description of qualification level	Requirements for knowledge, skills, communication, responsibility and autonomy	Indicator assessments
	Satisfactory mastery of responsibility and autonomy competencies (fragmentary level)	60-64
	The level of responsibility and autonomy is unsatisfactory	<60

7 TOOLS, HARDWARE AND SOFTWARE

Technical learning aids: multimedia and computer devices.

Distance learning tools: Moodle , MS Teams .

Software packages: MS Office.

The university email account (student.ip@nmu.one) has been activated on Office365.

8 RECOMMENDED SOURCES OF INFORMATION

8.1. Basic

1. Innovative tools for ensuring sustainable social development in the conditions of a knowledge economy: teaching aids (in slides) / T. V. Mamatova , V. M. Molokanova, I. A. Chikarenko . – Dnipro: DRIDU NADU, 2018. –1 electronic optical disk (CD-ROM).

2. Systemic analysis in management development complex systems: teaching aids /V.M. Molokanova, A.V. Malienko , M.M. Odnovol , O.B. Vladyko ; Ministry of Education and Science of Ukraine , National Technical University " Dnipro " Polytechnics . – Dnipro : NTU “DP”, 2024. – 95 p .

3. A Guide to the Project Management Body of Knowledge (PMBOK® Guide) / Project Management Institute, Inc.; Sixth Edition, 2017. - 756

4. The Standard for Program management. (2017) Project Management Institute, Inc. Four Campus Boulevard Newtown Square, Pennsylvania USA .

5. Project Management Institute, PMI (2015). Delivering on Strategy: The Power of Project Portfolio Management. Thought Leadership Series November 2015. ©PMI.

8.2. Additional literature

1. Molokanova V. M. Changes in the management of project portfolios of an organization in the context of behavioral economics / V. M. Molokanova // Applied aspects of information technologies: collection of scientific works. –Odessa: Science and Technology . – 2019. – No. 4. Vol. 2. – P. 345–358.

2. Molokanova V. M. Project-oriented development of organizations based on the evolutionary theory of values / V. M. Molokanova // Project management and production development: collection of scientific works –Luhansk: V. Dahl SNU, 2015. – No. 4(56). – P. 22–33.

3. Molokanova V. M. Synergetic aspect of organization adaptation to changes in the external environment / V. M. Molokanova // East European Journal of

Advanced Studies technologies : Coll . of science Ave. – 2015. – No. 5/3(77). - S. 4-10.

4. Molokanova V. M. Value- oriented analysis of decision-making in project management / V. M. Molokanova // Management of complex systems development: collection of scientific works – Kyiv: KNUBA. – 2016. – No. 25. − P. 32–39.

9 INFORMATION RESOURCES

Repository of the National Technical University "Dniprovska Polytechnic": http://ir.nmu.org.ua/

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