MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
LUTSK NATIONAL TECHNICAL UNIVERSITY
FACULTY OF BUSINESS AND LAW

APPROVED
Dean of the Faculty
_____ Liubov KOVALSKA
26.08.2026

APPROVED
First Vice-Rector
_____ Nadiia KOVALCHUK
26.08.2026

SYLLABUS

of the educational component "Management of scientific and innovative projects"
higher education degree – Doctor of Philosophy
field of knowledge – F Information Technologies
specialty – F2 Software Engineering
educational programme – Software Engineering

Department of Management

Syllabus developed by Head of the Department, DSc, Professor Nataliia VAVDIIUK

The syllabus was approved at the meeting of the Department of Management, minutes No. 1 of 26.08.2026

Head of the Department DSc, Professor Nataliia VAVDIIUK

Reviewed and approved by the support group of the educational programme "Software Engineering", minutes No. 1 of 26.08.2026

Guarantor of the educational programme "Software Engineering" PhD, Associate Professor Valerii LISHCHYNA

Approved by the Scientific and Methodological Council of the University, minutes No. 1 of 26.08.2026

Approved syllabus online:
https://e.lntu.edu.ua/syllabus/2286

Lutsk – 2026

SYLLABUS OF THE EDUCATIONAL COMPONENT "Management of scientific and innovative projects"

Educational programme	Software Engineering
Field of knowledge / Specialty	F Information Technologies / F2 Software Engineering
Level of higher education	third (educational and scientific)
Course status	compulsory
Language of instruction	English
Workload	5 ECTS credits / 150 hours, semester 1
Form of final assessment	exam
Lecturer(s)	DSc, Professor Nataliia VAVDIIUK

1. Course aim and objectives

Aim: The aim of the course is to build a body of knowledge and practical skills regarding the organization and management of scientific and innovation projects; to master the methodological tools for developing project proposals and grant applications, as well as for identifying and securing funding sources; to form interdisciplinary project teams and ensure their effective interaction; to acquire competencies in effective project management; and to foster the academic mobility of researchers.

Objectives: – developing systemic knowledge and practical skills among PhD candidates necessary for planning, organizing, and managing scientific and innovation projects, regardless of the research field or subject area;
– mastering modern approaches and methodological tools for the development, planning, financing, implementation, and evaluation of scientific and innovation projects;
– building skills in preparing project proposals and grant applications, as well as identifying and securing funding sources for scientific and innovation activities;
– acquiring practical skills in forming and organizing interdisciplinary project teams, ensuring effective communication, and distributing responsibilities among project participants;
– developing the ability to apply project management tools for resource planning, risk management, performance monitoring, and outcome evaluation of scientific and innovation projects;
– fostering the ability to effectively organize one's own research activities and engage in professional interaction within academic and scientific environments, including in an international context.

Prerequisites: the foundational training of students, acquired through prior education and the passing of the Unified Entrance Exam (UEE) and the Unified Professional Entrance Test (UPET), as well as knowledge of the fundamentals of research methodology

2. Competences

IC — integral competence: An individual's ability to solve complex tasks and problems in a specific field of professional activity or during the learning process, which entails conducting research and/or implementing innovations and is characterized by uncertainty regarding conditions and requirements.

GC03 — Ability to work in an international context.

GC04 — The ability to present ideas, innovative developments, and research results to both the scientific and professional communities.

SC07 — The ability to initiate, develop, and implement research and innovation projects in the field of software engineering, and to plan and organize the work of research teams.

3. Course structure, distribution of hours, links between topics and competences

No.	Topic	Lectures	Pract./ Semin./ lab	Self-study	Total	Teaching methods	Assessment methods	GC and SC
Content module 1. Fundamentals of Scientific and Innovation Project Management								
1	Topic 1. National model of the scientific and innovation project management system	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
2	Topic 2. Scientific and innovation project (program): essence, classification, and development procedure	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
3	Topic 3. Organization of the management process for scientific and innovation projects	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
4	Topic 4. Planning the development of a scientific and innovation project	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
5	Topic 5. Intellectual property, technology transfer, and commercialization of research results	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
Content module 2. Management of the implementation of scientific and innovation projects								
6	Topic 6. Organization of funding for scientific and innovation projects	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	

No.	Topic	Lectures	Pract./ Semin./ lab	Self-study	Total	Teaching methods	Assessment methods	GC and SC
7	Topic 7. Funding for research and innovation projects through European programs and grants	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
8	Topic 8. Management of innovation and research project execution processes	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
9	Topic 9. Management of Scientific and Innovation Projects in the Context of Digitalization	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
10	Topic 10. Risk Management for Research and Innovation Projects	3	3	9	15	TM1, TM2, TM3, TM4, TM5, TM6, TM7	AM1, AM2, AM4, AM5, AM6, AM7, AM8	
	Total	**30**	**30**	**90**	**150**			

Legend: GC — general competence (number according to section 2); SC — special (professional) competence (number according to section 2). The full wording of each code is given in the educational programme / standard of the specialty.

Teaching methods: TM1 — verbal method (lecture, discussion, interview, etc.); TM2 — practical method (laboratory and practical classes); TM3 — visual method (illustration and demonstration); TM4 — work with educational and methodological literature (note-taking, abstracts, annotations, reviews, essays); TM5 — video method combined with up-to-date information technologies and computer-based learning tools (distance, multimedia, web-based, etc.); TM6 — independent work (problem solving); TM7 — individual research work of students.

Assessment methods: AM1 — exam; AM2 — oral or written survey; AM4 — testing; AM5 — team projects; AM6 — essay; AM7 — presentation of the results of completed tasks and research; AM8 — presentation and speeches at scientific events.

4. Learning outcomes

PLO03. To propose new, effective methods and models for software development, implementation, maintenance, and quality assurance, as well as for managing the associated processes throughout the entire lifecycle.

PLO09. Formulate and solve problems related to optimization, adaptation, forecasting, control, and decision-making concerning the processes, tools, and resources for software development, implementation, maintenance, and operation.

PLO11. To develop and implement scientific and/or innovative IT projects that enable the rethinking of existing knowledge and the creation of new, holistic knowledge and/or professional practice, as well as the resolution of significant scientific and applied problems in software engineering, while adhering to academic ethics and considering social, economic, and legal aspects.

PLO12. Ensure the protection of intellectual property in the field of software engineering.

5. Sustainable Development Goals

SDG 9 – Industry, Innovation and Infrastructure

SDG 17 – Partnerships for the Goals

6. Non-formal education

Regarding recommended courses, training sessions, internships, and other activities: learning outcomes acquired through formal, non-formal, or informal education may be recognized in accordance with LNTU procedures. Proof may consist of certificates from specialized training sessions, webinars, or online courses, accompanied by a description of the achieved learning outcomes and, if necessary, a brief verification task or a portfolio.

7. Assessment criteria and forms of control

Assessment is based on a 100-point scale (national scale / ECTS). Final grade = continuous assessment (60 %) + exam (40 %).

Academic integrity: independent completion of assignments; correct citation of sources; marking parts of the text generated by AI tools. Violations of academic integrity are not tolerated.

8. Content of topics

Topic 1. National model of the scientific and innovation project management system

The system of organization and management of research and innovation activities in Ukraine and the EU. Key stakeholders, institutions, and mechanisms for supporting research and innovation. National and international funding opportunities. Internationalization of science, academic mobility, and international project collaboration. Fundamentals of academic integrity and responsible conduct of research.

Topic 2. Scientific and innovation project (program): essence, classification, and development procedure

The nature, characteristics, and types of scientific and innovation projects. Project participants and the project environment. The project life cycle and the main stages of its development. Project initiation: defining the problem, goal, objectives, and expected results. Fundamentals of preparing a project proposal and a grant application.

Topic 3. Organization of the management process for scientific and innovation projects

Principles and functions of managing scientific and innovation projects. Organizational structures and the distribution of roles and responsibilities. Project teams and participant interaction. Communication and stakeholder management. Modern project management approaches and standards.

Topic 4. Planning the development of a scientific and innovation project

Planning project content, stages, outcomes, and resources. Work structuring and scheduling. Budget and expenditure planning. Funding sources and financial planning requirements. Monitoring resource utilization and making adjustments to the plan and budget.

Topic 5. Intellectual property, technology transfer, and commercialization of research results

Identification and protection of the results of scientific and innovation activities. Fundamentals of intellectual property management. Discovery, patenting, and other forms of protection for research results. Technology transfer, implementation, and commercialization of the results of scientific activities.

Topic 6. Organization of funding for scientific and innovation projects

Models and sources of funding for research and innovation projects. Competitive and grant-based funding mechanisms. National, international, institutional, and private sources of support. Co-financing and the combination of funding sources. Fundamentals of financial planning and grant fund management.

Topic 7. Funding for research and innovation projects through European programs and grants

European and international programs supporting research, innovation, the development of research competencies, and mobility. Key types of grant instruments: individual, collaborative, networking, mobility, innovation, and infrastructure projects. Horizon Europe and its primary opportunities for researchers and project teams. Other international programs and funds supporting science and innovation. Finding relevant calls for proposals, assessing project alignment with call requirements, and preparing grant applications.

Topic 8. Management of innovation and research project execution processes

Project execution monitoring and control. Assessment of progress, results, timelines, and resource utilization. Budget control and management of plan deviations. Change management. Project reporting and preparation for performance evaluation.

Topic 9. Management of Scientific and Innovation Projects in the Context of Digitalization

Digital tools for planning, communication, monitoring, and managing research and innovation projects. Digital platforms for finding partners, competitions, and grant opportunities. Research data and digital resource management. Use of artificial intelligence in project preparation and management, while adhering to principles of academic integrity, research ethics, and data security. Open science and digital collaboration.

Topic 10. Risk Management for Research and Innovation Projects

Concepts and types of risks in scientific and innovation projects. Risk identification and assessment. Planning risk response and mitigation measures. Risk monitoring and change management. Specifics of managing scientific, financial, organizational, partnership, and regulatory risks.

9. Individual assignments

Not provided for by the curriculum.

10. General requirements

The educational process is governed by the academic regulations of LNTU. Students are required to read the requirements set out in the LNTU Code of Academic Integrity and the LNTU Policy on the Ethical Use of Artificial Intelligence, and to adhere to the principles of academic integrity and the ethical use of artificial intelligence in their educational activities.

Academic integrity. Participants of the educational process must comply with the Law of Ukraine “On Academic Integrity” of 18.12.2025 No. 4742-IX and the internal regulations of LNTU. Academic plagiarism, fabrication, falsification, misappropriation of authorship, non-independent completion of assignments, as well as dishonest use of results generated by artificial intelligence are not allowed.

Use of artificial intelligence. Artificial intelligence tools may be used to search for ideas, explain methods, provide preliminary structuring, language editing and auxiliary analysis of non-confidential data, unless a specific assignment requires fully independent work. Students must indicate the tool used, the purpose and the stage of its use, check facts and calculations, and justify their conclusions independently.

11. References

I. Teaching and methodological materials

Works by the syllabus author:

1. Management of Scientific and Innovation Projects [Text]: lecture notes for students of the third (educational-scientific) level of higher education / compiled by N.S. Vavdiuk, N.S. Kutsai, D.V. Smolych. Lutsk: LNTU, 2022. 152 p.

2. Management of Scientific and Innovation Projects [Text]: methodological guidelines for practical and independent work for students of the third (educational-scientific) level of higher education / compiled by N.S. Vavdiuk, N.S. Kutsai, D.V. Smolych. Lutsk: LNTU, 2022. 48 p.

Works by other authors:

3. Сазонець І. Л., Ковшун Н. Е. Управління науковими проектами: навч. посібник. Київ: Центр учбової літератури, 2021. 208 с.

4. Корнілович Б. Ю., Спасьонова Л. М., Весельська О. Я. Міжнародні наукові проєкти [Електронний ресурс]: навч. посіб. Київ: КПІ ім. Ігоря Сікорського, 2021. 93 с.

II. Scientific works

Works by the syllabus author:

5. Vavdiiuk, N., Koretska, N., Konstankevych, I., Riznyk, D. Transformation of HEIs for sustainable development. Bulletin National University of Water and Environmental Engineering. Series “Economic Sciences”. 2026. № 2 (114). DOI: https://doi.org/10.31713/ve220262

6. Vavdiiuk, N., Koretska, N., & Konstankevych, I. (2026). ESG management of bank lending in Ukraine. Economic Sciences: Collection of Scientific Papers of Lutsk National Technical University. Series: Regional Economics, 22(87), 21–40. https://doi.org/10.36910/2707-6296-2025-22(87)-2

7. Vavdiiuk N., Koretska N., Smolych D., Abramova I., Tendiuk A. Digital Models of Administration as a Mechanism for Enhancing Leadership Accountability in Dynamic Institutions. Computer and Decision Making: An International Journal. 2026. Vol. 3. P. 979–995. https://doi.org/10.59543/comdem.v3i.18331

8. Vavdiiuk, N., Koretska, N., Koshchii, O., Vasilik, N., Galushchak, V., & Virun, L. (2026). Digital leadership in Industry 4.0 and 5.0. Journal of Intelligent Decision Making and Information Science, 2026. Vol. 3(3s), Pp. 246–265. https://doi.org/10.59543/jidmis.v3.795

9. Lutkovska, S., Puzyryova, P., Vavdiiuk, N., Bezkrovnyi, O., Mykola, K., & Kutsai, N. Methodology for modeling innovative strategies for financial security of competitive agro-industrial smart enterprises in the startup management system. Financial and Credit Activity Problems of Theory and Practice. 2025. Vol. 6(65). P. 307–323. URL: https://repository.lntu.edu.ua/handle/123456789/3813

10. Земко А. М., Вавдіюк Н. С., Лук’янчук Ю. А. Штучний інтелект у публічному секторі: етичні принципи, стандарти безпеки та відповідальність державних службовців. Актуальні проблеми сталого розвитку. 2025. Т. 2, № 3. С. 151–156. URL: https://repository.lntu.edu.ua/handle/123456789/4451

11. Vavdiiuk N., Konstankevych I., Podash A. Management of the SDGs Achievement Process in LNTU Scientific Activities. Economy and Society. 2024. No. 64. https://doi.org/10.32782/2524-0072/2024-64-93

12. Vavdiiuk N., Koretska N., Konstankevych I., Tretiak O. Methodology of SWOT analysis of digital educational activities of LNTU. Економічний форум. 2023. №1. С. 53–63. URL: https://doi.org/10.36910/6775-2308-8559-2023-1-8

Works by other authors:

13. Riesener, M., Kuhn, M., Keuper, A., & Schuh, G. (2023). A literature analysis on success factors and their corresponding scientific approaches in multi-project management. Procedia CIRP, 119, 1176–1181.

14. Flyvbjerg, B. (2021). Top ten behavioral biases in project management: An overview. Project Management Journal, 52(6), 531–546.

15. Івко, А. В. (2023). Аналіз моделей спільного використання методологій в управлінні проєктами проєктно-орієнтованих організацій. Управління розвитком складних систем, (55), 38–45.