MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
LUTSK NATIONAL TECHNICAL UNIVERSITY
FACULTY OF COMPUTER AND INFORMATION TECHNOLOGIES

APPROVED
Dean of the Faculty
_____ Inna KONDIUS
29.08.2026

APPROVED
First Vice-Rector
_____ Nadiia KOVALCHUK
29.08.2026

SYLLABUS

of the educational component "Product Management"
higher education degree – Bachelor
field of knowledge – 12 Information Technology
specialty – 122 Computer Science
educational programme – Computer Science

Software Engineering Department

Syllabus developed by Associate Professor, PhD Olena SURYNOVYCH

The syllabus was approved at the meeting of the Software Engineering Department, minutes No. 1/1 of 28.08.2026

Head of the Department PhD, Associate Professor Nataliia LISHCHYNA

Reviewed and approved by the support group of the educational programme "Computer Science", minutes No. 2 of 28.08.2026

Guarantor of the educational programme "Computer Science" PhD, Associate Professor Nina ZDOLBITSKA

Approved by the Scientific and Methodological Council of the University, minutes No. 1/a of 29.08.2026

Approved syllabus online:
https://e.lntu.edu.ua/syllabus/3444

Lutsk – 2026

SYLLABUS OF THE EDUCATIONAL COMPONENT "Product Management"

Educational programme	Computer Science
Field of knowledge / Specialty	12 Information Technology / 122 Computer Science
Level of higher education	first (bachelor's)
Course status	Elective
Language of instruction	English
Workload	5 ECTS credits / 150 hours
Form of final assessment	Pass/fail test
Lecturer(s)	PhD, Associate Professor Olena SURYNOVYCH e-mail: o.sivakovskaya@lutsk-ntu.com.ua

1. Course aim and objectives

Aim: The aim of the discipline "Product Management" is to provide students with theoretical knowledge and practical skills in planning, developing, and managing software products and digital solutions throughout their life cycle. The course aims to develop competencies in product strategy, requirements analysis, market research, financial planning, data-driven decision-making, and effective collaboration with stakeholders and development teams.

Objectives: 1. Develop an understanding of the fundamental principles, methodologies, and processes of Product Management in different market segments.
2. Provide practical skills in analyzing technical and business requirements, conducting market research, and developing product strategies and roadmaps.
3. Develop competencies in product life cycle management, portfolio planning, budgeting, and performance evaluation using metrics and KPIs.
4. Foster the ability to integrate Product Management practices into software development processes and digital transformation initiatives.
5. Enhance teamwork, communication, strategic decision-making, and awareness of ethical and social responsibilities in Product Management.

Prerequisites: Algorithmization and Programming. Object-Oriented Programming. Web Technologies and Web Design. Foreign Language for Professional Purposes.

2. Competences

SC05 — Ability to formally describe operations research problems in organizational, technical, and socio-economic systems of various purposes, determine their optimal solutions, develop optimal management models considering changes in economic conditions, and optimize management processes in systems of various purposes and hierarchical levels.

SC10 — Ability to apply methodologies, technologies, and tools for managing the life cycle processes of information and software systems, products, and information technology services in accordance with customer requirements.

SC15 — Ability to analyze and functionally model business processes, develop and practically apply functional models of organizational, economic, and industrial-technical systems, and use methods for assessing risks associated with their design.

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

No.	Topic	Lectures	Pract./ Semin./ lab	Self-study	Total	Teaching methods	Assessment methods	SC
Content module 1. Fundamentals of Product Management and Product Strategy								

No.	Topic	Lectures	Pract./ Semin./ lab	Self-study	Total	Teaching methods	Assessment methods	SC
1	Topic 1. Product Management Concept. Key Objectives, Tasks and Challenges for B2B, B2C, B2G (Government) Market Segments.	2	2	8	12	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC10, SC15
2	Topic 2. The Role of Technical Product Management in Software Engineering.	2	2	8	12	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC10
3	Topic 3. Integration of Product Management into Software Development Life Cycle (SDLC) Models.	2	2	8	12	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC10
4	Topic 4. Analysis of Technical and Business Requirements, Market Research, and User Scenarios (Use Cases).	4	4	8	16	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC05, SC15
5	Topic 5. Developing the Technical Product Strategy and Architectural Roadmap.	4	4	8	16	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM4, AM5, AM7, AM9	SC05, SC10
Content module 2. Product Life Cycle Management and Strategic Decision-Making								
6	Topic 6. Product Portfolio Management. Product Life Cycle Roadmap. Important Differences for Start-Ups, SMEs, and Corporations.	4	4	8	16	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC05, SC10
7	Topic 7. Product Development Budget Setup. Product Lifetime P&L Formats.	2	2	8	12	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC05, SC15

No.	Topic	Lectures	Pract./ Semin./ lab	Self-study	Total	Teaching methods	Assessment methods	SC
8	Topic 8. Data-Driven Product Management. Core Metrics and Key Performance Indicators.	4	4	8	16	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC05, SC10
9	Topic 9. Digital Transformation of the Enterprise through Engineering Innovation.	2	2	8	12	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC10, SC15
10	Topic 10. Main Collaboration Principles with Cross-Functional Teams. Company Internal Resistance Management.	2	2	9	13	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM5, AM7, AM9	SC10, SC15
11	Topic 11. Ethical and Strategic Social Aspects of Product Management.	2	2	9	13	TM1, TM2, TM3, TM4, TM5, TM6	AM2, AM4, AM5, AM7, AM9	SC10, SC15
	Total	**30**	**30**	**90**	**150**			

Legend: 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).

Assessment methods: AM2 — oral or written survey; AM4 — testing; AM5 — team projects; AM7 — presentation of the results of completed tasks and research; AM9 — pass/fail test.

4. Learning outcomes

Know:

– The fundamental concepts, principles, functions, and methodologies of Product Management, including the specific characteristics of managing products in B2B, B2C, and B2G markets.

– The role of a Technical Product Manager and the principles of integrating Product Management into the Software Development Life Cycle (SDLC).

– Methods of market analysis, identification of user needs, and analysis of business and technical requirements for IT products.

– Principles of developing product strategies, product roadmaps, and managing product portfolios.

– Fundamentals of product budgeting, economic efficiency assessment, and the use of Profit and Loss (P&L) financial indicators.

– Core product metrics and Key Performance Indicators (KPIs) for data-driven decision-making.

– Principles of cross-functional team collaboration, change management, and ethical and social aspects

of digital product development.

Be able to:

– Analyze user needs, market opportunities, and the competitive environment to determine the value proposition of an IT product.

– Define business and technical requirements, develop user scenarios (Use Cases), and prioritize product features.

– Develop product strategies and roadmaps considering technical and business constraints.

– Plan the main stages of the product life cycle, identify required resources, and assess product development risks.

– Prepare basic product budgets, analyze costs and revenues, and evaluate economic performance indicators.

– Identify and analyze Key Performance Indicators (KPIs) and use data to support informed product decisions.

– Collaborate effectively with cross-functional teams, present product decisions, and consider ethical aspects of digital product management.

Upon successful completion of the discipline, students will be able to apply the fundamental principles and methodologies of Product Management; analyze market needs, customer requirements, and business processes; develop product strategies and roadmaps; manage software products throughout their life cycle; plan product budgets and evaluate performance using key performance indicators (KPIs); make informed management decisions; collaborate effectively with cross-functional teams; communicate professionally in English; and consider ethical, social, and strategic aspects of Product Management in modern digital environments.

5. Sustainable Development Goals

SDG 4 – Quality Education

SDG 8 – Decent Work and Economic Growth

SDG 9 – Industry, Innovation and Infrastructure

SDG 12 – Responsible Consumption and Production

6. Non-formal education

Recommended courses, training programs, internships, and other activities: Learning outcomes acquired through formal, non-formal, or informal education may be recognized in accordance with the procedures established by Lutsk National Technical University (LNTU). Supporting evidence may include certificates from relevant training programs, webinars, or online courses, accompanied by a description of the achieved learning outcomes and, if necessary, a short verification assignment or portfolio.

7. Assessment criteria and forms of control

Assessment is based on a 100-point scale (national scale / ECTS). Final grade = continuous assessment (60 %) + module tests (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. Product Management Concept. Key Objectives, Tasks and Challenges for B2B, B2C, B2G (Government) Market Segments.

Fundamental concepts, principles, and objectives of Product Management. The role of Product Management in modern digital businesses. Key responsibilities of a Product Manager. Characteristics and differences between B2B, B2C, and B2G market segments. Customer needs, market expectations, and business value. Main challenges and opportunities in managing digital products across different

market segments.

Topic 2. The Role of Technical Product Management in Software Engineering.

Definition and responsibilities of Technical Product Management. The role of a Technical Product Manager in software development. Differences between Product Manager, Technical Product Manager, Project Manager, and Product Owner. Interaction between business and technical teams. Technical feasibility, product requirements, and stakeholder expectations. The importance of technical knowledge in product decision-making.

Topic 3. Integration of Product Management into Software Development Life Cycle (SDLC) Models.

Overview of Software Development Life Cycle (SDLC) models. Integration of Product Management activities into different stages of software development. Product planning, requirements definition, development, testing, deployment, and maintenance. Product Management approaches in Waterfall, Agile, Scrum, and DevOps environments. Continuous feedback, iterative development, and product improvement.

Topic 4. Analysis of Technical and Business Requirements, Market Research, and User Scenarios (Use Cases).

Topic Content: Identification and analysis of business and technical requirements. Functional and non-functional requirements. Market research methods and competitor analysis. Identification of target audiences and customer needs. Development of user personas, user stories, and use cases. Requirements prioritization and validation. Communication with stakeholders and alignment of product requirements with business objectives.

Topic 5. Developing the Technical Product Strategy and Architectural Roadmap.

Principles of product strategy development. Product vision, mission, goals, and value proposition. Strategic analysis of market opportunities and technological capabilities. Development of technical product roadmaps. Architectural planning and selection of appropriate technologies. Prioritization of product features and development initiatives. Alignment of product strategy with business goals and technical constraints.

Topic 6. Product Portfolio Management. Product Life Cycle Roadmap. Important Differences for Start-Ups, SMEs, and Corporations.

Fundamentals of product portfolio management. Product life cycle stages: introduction, growth, maturity, and decline. Development and management of product life cycle roadmaps. Product portfolio analysis and prioritization. Resource allocation across multiple products. Differences in Product Management approaches for start-ups, small and medium-sized enterprises (SMEs), and large corporations. Product scaling, innovation, and strategic portfolio decisions.

Topic 7. Product Development Budget Setup. Product Lifetime P&L Formats.

Fundamentals of financial planning in Product Management. Product development budgeting and cost estimation. Identification of fixed and variable costs. Resource planning and budget allocation. Revenue models and pricing strategies for digital products. Profit and Loss (P&L) statements throughout the product life cycle. Financial performance indicators, profitability analysis, and return on investment (ROI). Financial risks and budget optimization.

Topic 8. Data-Driven Product Management. Core Metrics and Key Performance Indicators.

Principles of data-driven decision-making in Product Management. Collection, processing, and interpretation of product data. Identification and selection of key performance indicators (KPIs). Product metrics: user acquisition, engagement, retention, churn rate, conversion rate, and customer lifetime value (CLV). Product analytics tools and dashboards. A/B testing and data-based product optimization. Evaluation of product performance and strategic decision-making based on analytical results.

Topic 9. Digital Transformation of the Enterprise through Engineering Innovation.

Concepts and principles of digital transformation. The role of engineering innovation in business development. Integration of digital technologies into enterprise processes and products. Cloud computing, artificial intelligence, automation, and data analytics as drivers of digital transformation.

Development of innovative digital products and services. Digital transformation strategies and implementation challenges. Evaluation of technological innovation and its impact on business performance.

Topic 10. Main Collaboration Principles with Cross-Functional Teams. Company Internal Resistance Management.

Principles of effective collaboration in cross-functional product teams. Roles and responsibilities of developers, designers, analysts, testers, marketers, and Product Managers. Communication and coordination between technical and business departments. Stakeholder management and conflict resolution. Leadership and teamwork in Product Management. Organizational change management and identification of internal resistance. Strategies for overcoming resistance to innovation and digital transformation.

Topic 11. Ethical and Strategic Social Aspects of Product Management.

Ethical principles and social responsibility in Product Management. Responsible development and management of digital products. Data privacy, information security, and protection of user rights. Ethical challenges associated with artificial intelligence and automated decision-making. Accessibility, inclusivity, and user-centered product design. Sustainable development and environmental considerations in digital product management. The social impact of technological innovation and ethical decision-making in product strategy.

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

II. Scientific works

Works by the syllabus author:

1. Povstiana Y., Lishchyna N., Surynovych O., Boiko L., Kachula I. Architectural And Engineering Aspects Of Integrating The Novita Ai Api Into A Web Application For Image Generation. Computer-integrated technologies: education, science, production. 2026. № 62. P. 83-88. URL: https://repository.lntu.edu.ua/handle/123456789/4162

2. Ліщина Н. М., Суринович О. М., Корень В. В., Ліщина В. О. Аналіз та управління ризиками при розробці програмного комплексу для керування зарядними станціями електромобілів. Комп’ютерно-інтегровані технології: освіта, наука, виробництво. 2025. Вип. 61. С. 136-141. URL: https://repository.lntu.edu.ua/handle/123456789/3791

3. Khrystynets A., Surynovych O., Muliar , V., Pekh, P., & Khrystynets , N. Multilevel organization of rendering in modeling interactive maps. COMPUTER-INTEGRATED TECHNOLOGIES: EDUCATION, SCIENCE, PRODUCTION 2025. Вип.60. P. 86-91. URL:

https://repository.lntu.edu.ua/handle/123456789/703

4. Surynovych O., Lishchyna N., Lohatskyi V., Savluk M., Ryzhok S. New transliteration program “COTOGWA” development. Automation of Technological and Business Processes. 2024. Вип 16(3). P. 34-41. URL: https://repository.lntu.edu.ua/handle/123456789/4155

5. Surynovych O., Lishchyna N., Yashchuk A., Povstiana Y., Lishchyna V, Kukharchuk D. Web-Based Approach for Assessing CO_2 Emissions during the Russo-Ukrainian War. 2024 1th International Conference on Dependable Systems, Services and Technologies (DESSERT). Greece, 2024. P. 1-7. URL: https://repository.lntu.edu.ua/handle/123456789/3809

6. Остапчук О. В., Суринович О. М., Ліщина Н. М., Ліщина В. О. Аналіз ефективності методів сучасної реалізації шаблонів проектування в об’єктно-орієнтованому програмуванні. Вісник Хмельницького національного університету. Серія: Технічні науки. 2023. Вип. 329 (6). С. 281-285. URL: https://repository.lntu.edu.ua/handle/123456789/3795

Works by other authors:

7. Cagan M. Transformed: Moving to the Product Operating Model. Hoboken : Wiley, 2024. 368 p.

8. Lauchengco M. Loved: How to Rethink Marketing for Tech Products. Hoboken : Wiley, 2022. 320 p.

9. Pichler R. How to Lead in Product Management: Practices to Align Stakeholders, Guide Development Teams, and Create Value Together. London : Pichler Consulting, 2021. 220 p.

10. Olesen D. The Product Momentum Gap: Bridging the Divide between Product Strategy and Design-Delivery. Amsterdam : Bis Publishers, 2022. 272 p.

11. Forsgren N., Humble J., Kim G. Accelerate State of DevOps: Strategies for a New Economy. Portland : IT Revolution Press, 2021. 240 p.

12. Newman S. Building Microservices. 2nd ed. Sebastopol : O’Reilly Media, 2021. 620 p.

13. Torres T. Continuous Discovery Habits: Discover Products that Create Customer Value and Business Value. Portland : Product Talk LLC, 2021. 240 p.

14. Fitzpatrick R. Write Useful Books: A Modern Approach to Designing and Refining Recommendable Nonfiction. London : The Workshop Survival Guide, 2023. 300 p.

15. Rogers D. The Digital Transformation Roadmap: Rebuild Your Organization for Continuous Change. New York : Columbia Business School Publishing, 2023. 328 p.

16. Kumar V. 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization. 2nd ed. Hoboken : Wiley, 2022. 456 p.

17. Goel O., Jain A. Data-Driven Product Management: Strategies for Aligning Technology with Business Growth // Journal of Research in Professional Studies. 2024. Vol. 11, No. 4.