**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 – 123 Computer Engineering**
**educational programme – Computer Engineering**

**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 Engineering", minutes No. 2 of 27.08.2026

Guarantor of the educational programme "Computer Engineering" PhD, Associate Professor Svitlana LAVRENCHUK

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/3447

**Lutsk – 2026**

**SYLLABUS OF THE EDUCATIONAL COMPONENT "Product Management"**

| | |
|---|---|
| **Educational programme** | Computer Engineering |
| **Field of knowledge / Specialty** | 12 Information Technology / 123 Computer Engineering |
| **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<br>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:** Programming, Object-Oriented Programming, Computer Architecture, Foreign Language for Professional Purposes.

## 2. Competences

— Ability to present work results in the form of presentations and scientific and technical reports.

— Ability to solve problems in the field of computer and information technologies and identify the limitations of these technologies.

— Ability to design systems and their components considering all aspects of their life cycle and the assigned task, including development, configuration, operation, maintenance, and disposal.

— Ability to justify the choice of methods for solving specialized problems, critically evaluate the results obtained, substantiate and defend decisions made.

## 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 | |
| 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 | |
| 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 | |
| 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 | |
| 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 | |
| **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 | |
| 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 | |

| 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 | |
| 9 | Topic 9. Digital Transformation of the Enterprise through Engineering Innovation. | 2 | 2 | 8 | 12 | TM1, TM2, TM3, TM4, TM5, TM6 | AM2, AM5, AM7 | |
| 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 | |
| 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 | |
| | **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

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.