Національний технічний університет України
«КИЇВСЬКИЙ ПОЛІТЕХНІЧНИЙ ІНСТИТУТ
імені ІГОРЯ СІКОРСЬКОГО»

Department of Management
Theory and Practice

Creation and Development of IT Products

Curriculum of the academic discipline (Syllabus)

Course details

Level of higher education ***Second (master's)***

Field of knowledge	*05 Social and behavioural sciences*
Specialisation	*054 Sociology*
Educational programme	*Social Data Analytics*
Status of discipline	*Elective*
Form of study	*Full-time*
Year of study, semester	*1st year, spring semester*
Scope of the discipline	*120 hours (4 ECTS credits):* *18 hours of lectures, 36 hours of practical classes, 66 hours of independent work.*
Semester assessment/assessment measures	*Test, Modular control work*
Class schedule	*rozklad.kpi.ua*
Language of instruction	*Ukrainian*
Information about the course leader/teachers	*Yevheniia Oleksandrivna Arkhipova, PhD in Philosophy, Associate Professor* *evgar55@gmail.com*
Course location	https://classroom.google.com/c/NjYxMjg3NTI4NjM0?cjc=zvi7kmj

Curriculum

1. Description of the course, its purpose, subject matter and learning outcomes

The course was created as part of an educational project involving the Ministry of Digital Transformation, the Ministry of Education and Science, the Ukrainian IT company Genesis, the Product IT Foundation for Education, and Ukrainian higher education institutions. This is the first nationwide interactive course in the format of a virtual internship for students of higher education institutions from the Ukrainian product IT business, which offers students lectures and interactive activities on the LMS platform, combined with seminars led by a certified teacher (course coordinator).

The discipline promotes the development of students' entrepreneurial thinking, strengthens the practical component in educational institutions, develops the product IT market, and provides career guidance in product IT.

The discipline provides basic knowledge of product IT, entrepreneurship, and product management, and also promotes the development of competencies for the first steps in a product IT company or starting your own product IT business. The discipline helps students navigate the basic processes of product IT companies, provides an overview of technical and non-technical professions in the IT field, and reveals the tasks and competencies of a product manager.

After studying the discipline, students will know:

- the stages of IT product creation and development, as well as the criteria for determining their success;
- what specialists can make up the product teams of IT start-ups and their roles in the team;
- who a product manager is, their main functions during product development, aspects of interaction and management in product companies;
- what a minimum viable product is, what methods exist for validating ideas, and how to work with hypothesis testing;
- basic marketing concepts in the field of IT products, ways to research and influence the target audience of a product;
- the specifics of the technical and non-technical components of a product team, aspects of programming language use depending on the product;
- basic terminology in the field of product IT.

Students will be able to:

- determine the success of IT products using special metrics;
- form a product team to launch their own start-up;
- validate their ideas using quantitative and qualitative surveys, as well as by testing hypotheses;
- use basic marketing tools to promote a product;
- interact with technical team members, understanding their role and function in product development;
- think in product and entrepreneurial categories;
- have basic competencies at the level of a trainee product manager.

According to the educational and scientific programme, mastering this discipline contributes to strengthening the following competencies and programme learning outcomes:

LC 01 Ability to think abstractly, analyse and synthesise.

FC 03 Ability to design and conduct sociological research, develop and justify its methodology.

FC 04 Ability to collect and analyse empirical data using modern methods of sociological research.

FC 12 Ability to apply modern statistical methods, models, digital technologies, and specialised software for modelling social processes.

PRN 03 Develop and implement social and interdisciplinary projects, taking into account social, economic, legal, environmental and other aspects of public life.

PRN 04 Apply scientific knowledge, sociological and statistical methods, digital technologies, and specialised software to solve complex problems in sociology and related fields of knowledge.

PRN 13 Apply modern, cutting-edge methods of sociological research in the context of the digitalisation of social relations.

2. Prerequisites and post-requisites of the discipline (place in the structural-logical scheme of training under the relevant educational programme)

The discipline "Creation and Development of IT Products" is an elective discipline that can be studied by students without any prerequisites.

The knowledge gained as a result of mastering the discipline can be used during research practice and the completion of a master's thesis.

3. Content of the academic discipline

1. Introduction to IT products. The success of IT products.
2. IT product team and non-technical professions in product IT. The profession of product manager.
3. Searching for and validating ideas.
4. Decision-making in product teams.
5. Product analytics.
6. Performance marketing and user engagement.
7. Market analysis tools and product target audience. Metrics.
8. Product design.
9. User behaviour. Techniques for working with behaviour patterns.
10. Technical aspects of IT product development. Technical specialists on the product team.
11. Team management and leadership.
12. IT product launch.

4. Training materials and resources

Basic resources:

1. Training materials and resources are available on the online internship platform. URL: https://strum.education/
2. Blog of the Ukrainian co-founding IT company Genesis: website. URL: https://www.gen.tech/blog

Additional sources:

1. Meshcheryakova K. "I want to go into product IT, but I don't know what it is." We explain together with Genesis experts. *High Bar Journal*. 30.08.2021. URL: https://journal.gen.tech/post/sho-take-productove-it
2. 30 years of independence and 5 Ukrainian unicorn startups. Who are they? 23 August 2021. *Dev.ua* : website. URL: https://dev.ua/news/unicorns-in-ukraine (accessed 10 May 2024).
3. Top technology companies in the world. *Forbes*: website. URL: https://www.forbes.com/top-digital-companies/list/ (accessed 10 May 2025)

Shevchenko K. Structuring chaos: who is a product manager. *High Bar Journal*. 2022. URL: https://journal.gen.tech/post/hto-takyi-product-manager (accessed 10.05.2024).

5. Product Development Cycle. *Productplan*: website. URL: https://www.productplan.com/glossary/product-development-cycle/
6. Solkariyan L. How to launch an educational project, or how 15 juniors created a service for

Ukrainians who have moved abroad in 3 months. *Dev.ua*: website. 8.04.2024. URL: https://dev.ua/blogs/posts/yak-zapustyty-osvitnii-proiekt-blog

Educational content

5. Methodology for mastering the academic discipline (educational component)

Structure of the academic discipline

Lectures
Lecture 1. Introduction to the discipline. IT product team ● Course objectives and structure ● The sphere of IT products, the value of IT products ● Business model and monetisation ● Basic metrics ● Product market fit ● Product development cycle ● What specialists make up the product team ● basic patterns and dynamics of interaction between different team members
Lecture 2. The profession of a product manager. Searching for and validating ideas ● The concept of a product manager. What product managers do (competencies) ● Hard skills and soft skills of product managers. Areas of responsibility of product managers.
● How a product manager sets goals for the team and measures them ● The concept and development of a product strategy ● How to find an idea for your product. The Uber case study ● Needs and pains of the target audience ● Target audience research (quantitative and qualitative), desk research ● MVP: concept, stages, idea testing criteria, success criteria
Lecture 3. Decision-making in IT products ● Prioritising tasks when working on a product ● RICE framework for task prioritisation ● Value/Effort prioritisation model ● Design thinking ● The art of saying "yes" or "no"
Lecture 4. Product analytics ● What are metrics and how to measure them ● Metrics for measuring in a product ● Hypotheses (how to form and test them) ● A/B testing ● SQL, databases ● Product analyst: tasks, hard skills, and soft skills

Lecture 5. Marketing in product IT

- What are the areas of marketing in a product team
- Performance marketing and user engagement
- basic marketing concepts
- Market analysis tools and target audience of the product.
- Metrics. How marketers work with metrics
- Market and target audience analysis tools (SimilarWeb, SensorTower, Quora)

Lecture 6. Product design

- the essence and tasks of design
- design trends in product IT
- The essence of product design
- Product designer, motion designer, illustrator, and marketing designer
- The role and place of the product designer in the development of IT products

Lecture 7. User behaviour in IT

- The concept of user experience
- Basic rules of product user behaviour
- Brian Fog's behavioural model
- Nudging. Techniques for working with behaviour patterns
- Ways to encourage users to use the product
- Behavioural tricks

Lecture 8. The technical side of IT product development. Technical specialists on the product team

- the impact of the technical part on the product development process
- Technical specialities in product IT

- Technical specialists in the product team
- What testers and developers work with on a daily basis
- Basic programming languages

Lecture 9. Team management and leadership

- basics of team management
- principles of hiring employees
- basic team management processes
- manager competencies
- Team motivation and management tools

Seminar classes

Seminar 1. Course launch. The profession of product manager

1. Why this course is important.
2. How the training will be conducted
3. How the course will be assessed, syllabus.

4. Course opportunities for students
5. Who is a product manager, what skills do they have
6. How a product manager sets goals for the team and measures them
7. Developing a product strategy

Seminar 2. Opportunities in the IT product sphere

1. The IT product sector in figures;
2. Case study: creating IT products.
3. Game "Product: Need – Target Audience – Solution".
4. Announcement of the final course assignment.

Seminar 3. Defending homework assignment #1

Product description, product success analysis.

Seminar assignment. In pairs, analyse any product you use according to the given criteria. Justify why the product is successful. Prepare and present a slide using the template.

Product analysis criteria:

1. Value (What is the value of the product for the user?);
2. Target audiences (Who is the product designed for? Who uses the product?);
3. Needs (What needs and pain points of the target audience does the product address?);
4. Business model (How is the product monetised? How does it make money?);
5. Competitors (Which companies and products are direct and indirect competitors of the product being analysed?);
6. Number of users (How many users use the product?).
7. Assessment checklist:

- Availability of a completed slide;
- The product has been analysed according to all of the above criteria;
- The target audience for the product has been correctly identified (geography, demographics, social status, motivation);
- The needs that the product satisfies have been correctly identified based on reliable sources;
- A reasoned answer to the question "Why do we consider this product to be successful?", which is based on the categories and concepts studied in modules 1-2 of the course (namely, product market fit, profitability, retention, value for the user).

Seminar 4. The Lean Canvas model. IT product areas

1. Presentation of the Lean Canvas model;
2. Analysis of the Lean Canvas model of the ShortRead product;
3. Introduction to IT product areas;
4. Choosing the field of the future product.

Seminar 5. Team building

1. Roles in a team (examples of organising work on a product concept);

2. Questions and rules for teamwork.
3. Teamwork exercises.
4. Organising teamwork on the product concept.
5. Completing the team meeting checklist.
6. Voting

Seminar 6. Defend homework assignment #2

Seminar assignment. Describe any product from a selected niche as a team using the Lean Canvas model.

Assessment checklist:

- the Lean Canvas model is completed according to all the criteria specified in the template;
- presence of links to the information used;
- the student briefly presents the business concept based on the Lean Canvas model and answers questions.
- a qualitatively completed block with metrics;
- 2-3 metrics from the simulation course that correspond to the product are listed;
- North Star metric defined.

Seminar 7. Creativity, searching for non-standard solutions and searching for ideas

1. The concept of creativity
2. Brainstorming methods. Methods for finding ideas for products;
3. Methods of target audience research.
4. Brainstorming game: "Product for students".

Seminar 8. Consumer behaviour

1. Introduction to the laws and principles of UX design;
2. Specific examples of the use of UX design principles in IT products: case studies.
3. Research on the impact of UX design principles on consumer behaviour

Seminar 9. Defend homework assignment #3

Seminar assignment. Analyse any application or website that interests the student for the presence of UX design laws and principles.

Possible questions for analysis:

- which UX design laws and principles are present in the application;
- Where exactly, at what stage of interaction with the product are they used (illustrate with examples, screenshots from the application/website)?
- What specific function do these UX design laws and principles perform?
- How do they affect user behaviour?
- What can be added/changed/removed in the product's UX design? What examples from competing products can be given (if any)?

Seminar 10. IT professions and creating your own CV

- Main professions in IT;
- Analysis of the skills needed to start your career path;
- Creating a CV. Trends and recruiter requests.

Seminar 11. Presentation of homework assignment #4 (optional) Seminar assignment:

1. Find IT specialists on LinkedIn in one of the areas covered in the class;
2. Compose and write an introductory message to the specialists;
3. Share the results with your colleagues in class.

Seminar 12. Startup pitch decks and investments

1. Introduce students to the concept of investment and justify its importance for startups;
2. Pitch deck analysis — what it is, formats and types, general structure;
3. Examples of pitch decks — case studies.

Seminar 13. Product launch

- Product launch algorithm
- determining the success of an IT product.

- Modular test.

Seminar 14. Team consultations. Preliminary discussion Seminar 15.

Presentation of homework assignment No. 5:

Assignment content

- Prepare a presentation of your pitch deck according to the structure provided.
- Choose where and which investors the student plans to attract (platforms, angels, crowdfunding, etc.).
- Present the product idea in Idea and Elevator Pitch format during the class.

Seminars 16-17. Defence of assessment tasks

- Team defences
- Discussion
- Final vote

Seminar 18. Credit

6. Independent student work

All compulsory topics are covered in class and on the platform. Sources are provided for in-depth study of individual course topics.

Independent work by students includes:
preparation for classroom sessions – 56 hours;
preparation for the Modular control work – 4 hours;

preparation for the test – 6 hours.
Total – 66 hours.

Policy and control

7. Policy of the academic discipline (educational component)

Organisation of the discipline

The discipline programme provides for virtual internships on an online platform and student participation in practical classes with a teacher.

The online platform features video lectures from practitioners, lectures in dialogue format, microlearning and simulation blocks, case studies and experiences of modern Ukrainian companies, infographics, screencasts, tests, glossaries of terms, etc. The materials are grouped into 11 modules.
Students complete the modules on the online platform at their own pace but must meet the general deadlines for each module, as the online internship is synchronised with Zoom classes.

Classes, attendance and absences

All Zoom classes are interactive and include:

1. Exercises and training elements for skill development.
2. Team tasks for students.
3. Questions to engage the audience.
4. Opportunities for students to discuss materials and ask questions.
5. Information blocks from the teacher

The course programme provides for the defence (presentation) of the final team work in class, but under martial law, the form of reporting may be changed (individually or for all students, depending on how events unfold).

8. Types of control and rating system for assessing learning outcomes (RSO)

Ongoing assessment: participation in practical classes, completion of the online simulator, completion of thematic tasks.
Semester assessment takes the form of a test.

A student's rating for the discipline consists of points awarded for:

1) points on the platform (in the online simulator);
2) completion and presentation of homework assignments;
3) completion and defence of the final (certification) assignment.

1. Points on the platform (in the online simulator) – 54 points, including:
1.1. Compliance with the deadlines for completing modules on the platform.
11 modules completed on time * 1 point = 11 points

1.2. Successfully completing tasks on the platform.
By completing tasks in the online simulator, you can earn up to 83 points. Points are awarded for correct answers to test questions within the modules (58 points) and for the final test (25). 58+25=83 points on the platform.
To convert the points earned on the platform into the RSO component, these points are multiplied by a coefficient of 0.51. That is:

83 (maximum points in the online simulator) * 0.51 (fixed coefficient) = 43 points (RCO component).

2. Completion and presentation of homework assignments – 26 points.
The course includes 4 mandatory homework assignments:

Assignment content	Points
1. Analysis of a selected product according to criteria (in pairs)	5
2. Description of an existing product in the selected field using the Lean Canvas model	10
3. Application of UX design laws and principles. Consumer behaviour	6
4. Searching for product ideas. Brainstorming	5

3. Completion and defence of the final (certification) assignment – 20 points.
The final assignment consists of presenting a concept for the creation and development of an IT product. A brief summary of the work is presented in Appendix 1. The assessment criteria and checklist for the final assignment are published in Google Classroom.
Completed assignments and presentations are sent to Google Classroom, and the team presents their project during Zoom classes.

Applicants with a rating of 60 points or more receive a grade corresponding to their rating without additional tests.
For applicants with a rating of less than 60 points, as well as those who wish to improve their rating, the teacher conducts a semester assessment in the form of a test or interview.

Credit.
Weighting score – 100.
The test takes the form of a list of questions that the student must answer. The questions vary in content and correspond to the topics of lectures, seminars, independent work, and self-assessment questions.

Assessment criteria:
95-100 points - the student demonstrates a deep knowledge of the content of the course material, the ability to analyse issues in an interdisciplinary context, freely uses scientific concepts and terms, makes reasonable conclusions, and expresses their own position on controversial issues.
85-94 points - the student demonstrates a general understanding of the main topics and issues of the course, but makes some inaccuracies in definitions, examples or conclusions. The use of scientific terminology is partial or inconsistent, conclusions are not always substantiated.
75-84 points - the student has mastered the main provisions of the course, is able to reproduce key concepts and make descriptive conclusions, but the analysis is mostly superficial. The use of scientific terms is limited, the argumentation of conclusions is partial, and the student's own position on controversial issues is not clearly formulated.
65-74 points - the student demonstrates fragmentary knowledge, makes mistakes in definitions and examples, and does not always understand the key concepts of the course. Analytical thinking and application of knowledge are only partially evident, and conclusions are mostly descriptive and incomplete.
60-64 points - the student demonstrates superficial or fragmentary knowledge, is not familiar with the key concepts of the course, does not demonstrate analytical thinking or the ability to apply the knowledge gained; answers are illogical or incomplete.
0-60 - unsatisfactory, the answer does not meet the requirements

Table of correspondence between rating points and university scale grades:

Number of points	Grade
100-95	Excellent
94	Very good
84	Good
74-65	Satisfactory
64-60	Sufficient
Less than 60	Unsatisfactory
Admission requirements not met	Not admitted

Student assessment is conducted twice per academic semester (in weeks 8 and 14). A student is assessed if their current rating is at least half of the maximum possible score at the time of assessment.

9. Additional information on the discipline (educational component)

Taking online courses

Recognition of learning outcomes acquired through non-formal/informal education is carried out in accordance with the Regulations. For completing third-party online courses on the subject of the discipline (subject to presentation of the relevant certificate obtained during the semester), the student is awarded incentive points amounting to 10% of the semester rating (up to 10 points in total).

Some online courses on the subject:

IT product from scratch: from where to and how develop? (4 hours). URL: https://courses.prometheus.org.ua/courses/course-v1:Prometheus+IT101+2022_T1/about – 6 points

A successful start-up: from idea to scaling (3 hours) URL: https://courses.prometheus.org.ua/courses/course-v1:UkrainianStartupFund+S_STARTUP101+2023_T1/about – 5 points.

Academic integrity and ethical standards

The principles of academic integrity and ethical conduct are defined in Sections 2 and 3 of the Code of Honour of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". It is prohibited to present someone else's educational and/or scientific results as your own. For more details, please visit: https://kpi.ua/code.

Inclusive education

The academic discipline can be taught to all students with special educational needs. If necessary, assignments can be adjusted.

Foreign language instruction

Additional material within certain topics may be offered in English.

Curriculum (syllabus):

Compiled by:

Associate Professor of the Department of Management Theory and Practice, Candidate of Philosophical Sciences, Associate Professor, Yevgeniya Oleksandrivna Arkhipova

Approved by the Department of Management Theory and Practice (Minutes No. 15 of 07.06.2024).

Approved by the Methodological Commission of Igor Sikorsky KPI (Minutes No. 9 dated 26 June 2024).

Appendix 1

Final (certification) work

The final work is performed in a team.
The result of this teamwork should be the creation and presentation of an IT product concept (based on the Lean Canvas model) and an algorithm for its launch (based on the Genesis model).

To achieve this result, the following steps must be taken:

1. **Find a product idea**: the problem that the product solves;
2. **Identify ways to solve the problem**: how the product will solve this problem;
3. **Conduct basic market research:**
   - Who will be the target audience?
   - How many people need this product?
   - Who will be the users? How do they currently solve the problem?
   - Are there any competitors?
   - Are there any popular analogues of the product?
   - What is the value of the product? What does the product offer that others do not?
4. **Test the idea:** how can you verify that the product will be of interest to the audience? Are there those who are already prepared to use the product?
5. **Propose a monetisation method and business model:** how will the product generate revenue? What will users pay for?
6. **Define the product's goals**: how to measure the product's success? How to achieve the defined success?
7. **Make a plan and decide on the product's MVP:** what specialists will be needed to develop the product? What will the MVP be like?
8. **Determine the possibilities for product release**: how to promote the product? How will potential users find out about it? Under what conditions will they be able to use it for the first time?
9. How to organise **feedback** and continuous product improvement? How to collect and work with feedback?