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

Ecology and plant polymers technology

Organization of Scientific and Innovative Activities

Work program of the discipline (Syllabus)

Requisites of the Course

Level of higher education	***third (educational and scientific)***
Field of Study	*10 Natural Sciences*
Program Subject Area	*101 Environmental Studies*
Education Program	*Environmental Studies*
Type of Course	*Compulsory*
Mode of Studies	*full-time / part-time / distance / mixed*
Year of study, semester	*2 year (4 semester)*
ECTS workload	*4 credits (120 hours)*
Testing and assessment	*Final test*
Course Schedule	*3 classes per week (2 hours of lectures and 1 hour of practical classes)*
Language of Instruction	*Ukrainian*
Course Instructors	Lecturer: *https://eco-paper.kpi.ua/pro-kafedru/vykladachi/vizytky/khokhotva-oleksandr-petrovich.html* Practical / Seminar: *https://eco-paper.kpi.ua/pro-kafedru/vykladachi/vizytky/khokhotva-oleksandr-petrovich.html*
Access to the course	*https://do.ipo.kpi.ua/course/view.php?id=5252*

Outline of the Course

1. Course description, goals, objectives, and learning outcomes

Science as a system of knowledge that reveals the regularities of the development of nature and society and ways of influencing the surrounding world was born in the ancient world in connection with the needs of social practice. In its current form, science began to take shape in the 16th and 17th centuries, and up to now has already turned into a productive force that determines the level, prospects and effective ways of social and economic development of each individual enterprise, the state and humanity as a whole.

At the same time, the social well-being of citizens and the economic development of the state are determined not only and not so much by the mastery of scientific knowledge, the ability to see and successfully solve fundamental scientific problems, but by the ability to extract economic benefits from the achievements of science. Innovative activity, as a result of which scientific and technical achievements are transformed into new competitive products and new, more efficient technologies, has become the most important factor of the economic security of the state and its social and economic development.

In the modern conditions of powerful globalizational changes, education, science, and innovation are the determining factors designed to ensure the innovative development of society and the state, to create conditions for rapid market growth based on the renewal of technologies and products, and eliminate the significant lag behind the Ukrainian economy and the state from countries with developed innovative systems.

The subject *of the discipline «Organization of Scientific and Innovative Activities» is the study of theoretical concepts of innovative processes and scientific innovative activities.*

The purpose *of the discipline «Organization of Scientific and Innovative Activities» is the formation of a set of knowledge about the structuring and organization of the scientific innovation process, its*

information and investment support; about the stages of preparation and implementation of innovation processes and methods for determining their effectiveness, search for partners for joint implementation of scientific innovation projects, forms and sources of project financing, and innovation management. In accordance with the goa, the training of PhD students in this Subject Area requires strengthening the following competencies:

- *ability to work in an international context;*
- *ability to initiate, develop and implement complex innovative projects in the field of ecology and related interdisciplinary projects, leadership in their implementation;*
- *ability to critically analyze, evaluate and synthesize new and complex ideas;*
- *ability to adapt and generalize the results of modern research in the field of ecology to solve scientific and practical problems.*

According to the requirements of the program of the discipline "Organization of Scientific and Innovative Activity", postgraduate students must demonstrate the following ***program learning outcomes*** *after its completion:*

- *to deeply understand the conceptual principles and methodology of the natural sciences, formulate and test hypotheses, use appropriate evidence to substantiate conclusions, in particular, the results of theoretical analysis, experimental research and mathematical and/or computer modeling to solve significant scientific and applied environmental problems;*
- *to freely present and discuss in the state and foreign languages in compliance with the norms of academic ethics the results of research, scientific and applied problems in ecology, environmental protection and optimization of nature management, to qualitatively reflect the results of research in scientific publications in leading domestic and international scientific journals;*
- *to develop and implement scientific and/or innovative engineering projects that allow to rethink the existing and create new holistic knowledge and/or professional practice, taking into account social, ethical, economic, environmental and legal aspects;*
- *to apply modern tools and technologies for searching, processing and analyzing information on environmental problems and related issues, in particular, statistical methods for analyzing large and/or complex data, specialized databases and information systems;*
- *to have up-to-date conceptual knowledge and a high methodological level in the field of ecology and on the border of subject areas, as well as research skills sufficient to conduct scientific and applied research at the level of the latest world achievements;*
- *to know the priority state directions of development of science, engineering and technology in the professional and related fields;*
- *to demonstrate awareness of up-to-date strategies for environmental protection, environmental legislation, regulations on environmental protection.*

2. Prerequisites and post-requisites of the course (the place of the course in the structural and logical scheme of the studies in accordance with educational program)

The study of the discipline "Organization of Scientific and Innovative Activities" is based on the principles of integrating the various knowledge gained by graduate students during their studies at the master's program "Project and Grant Management", "Startup Project Management", as well as in the study of the disciplines "Foreign Language for Scientific Activity", "Philosophical Foundations of Scientific Activity", "Research Methodology". The course "Organization of Scientific and Innovative Activities" provides for the study of the disciplines "Modeling the state of a continuous environment", "Systems and methods of decision-making in ecology", the implementation and preparation of a dissertation for defense.

3. Content of the course

Section 1. Essential characteristics of innovations and innovation processes

Topic 1: The essence of the basic concepts of innovation activity
Topic 2. Formation and essence of innovation theories
Topic 3. Characteristics of the innovation process

Topic 4. Types of innovation structures and their characteristics
Topic 5. Innovative scientific and technical structures
Topic 6. Management of innovations in the field of science-intensive technologies

Section 2. Scientific, technical, technological innovations and changes

Topic 7. Basics of classification of innovations
Topic 8. The concept of an innovation project and its management
Topic 9: Risk assessment of innovation activities

Section 3. Public management of innovations and changes

Topic 10. The role of the state in creating a mechanism for regulating innovation

Section 4. The essence and features of patent and license trade

Topic 11. Patents and licenses
Topic 12: Patent and license activities in Ukraine

Section 5. Information support of innovation processes

Topic 13: Information resources in innovation activities

Section 6. Expertise and economic efficiency of innovative projects

Topic 14. Expertise of innovative projects
Topic 15. Economic efficiency of innovations

Section 7. Scientific partnership and financing of innovative scientific activities

Topic 16. Scientific partnerships
Topic 17. Financing and crediting of innovative activities
Topic 18: The concept of a grant

4. Coursebooks and teaching resources

Basic literature

1. *Mykytyuk P.P. Innovative management: textbook / P.P. Mykytyuk, V.Y. Brych, M.M. Shkilnyak, Y.I. Mykytyuk - Ternopil: TNEU Economic Thought, 2019. - 518 p.*
2. *Innovative management: a textbook / L.I. Mikhailova, O.I. Gutorov, S.G. Turchina, I.O. Sharko - 2nd edition, supplement - Kyiv: Center for Educational Literature, 2015. - 234 p.*

Additional literature

3. *Shevchenko L.S. Strategic innovation management: a textbook. Kharkiv: Yaroslav Mudryi National Law University, 2019. - p.*
4. *Innovative development of the enterprise: a textbook / Pugach A.M., Demchuk N.I., Dovgal O.V., Kryuchko L.S., Tyaglo N.V. - FOP Shvets V.M., 2018. - 348 p.*
5. *Kopytko M.I., Blaha N.V. Management of innovations and investments: a textbook in diagrams and tables. Edition 2, suppl. and revised. Lviv: Lviv State University of Internal Affairs, 2022. - 296 p.*
6. *Aleynikova O.V., Prytula N.M. Innovation and investment management. Study book. Kyiv: SHEI "University of Education Management", 2016. - 614 p.*
7. *National Research Council. 2015. Enhancing the Effectiveness of Team Science. Washington, DC: The National Academies Press. https://doi.org/10.17226/19007.*
8. *Methodical recommendations for participation in grant programs and competitions / Marchenko O.V., Sushko D.O. - Dnipro: DSUIA, 2018. - 68 p.*

Information resources in the Internet

9. *Ministry of Environmental Protection and Natural Resources of Ukraine / [Electronic resource]. – Access mode: https://mepr.gov.ua/*
10. *Professional Association of Ecologists of Ukraine (PAEU) / [Electronic resource]. – Access mode: https://paeu.com.ua/*

Educational content

5. Methodology

Lectures

Lectures are aimed at:

- *provision of up-to-date, holistic, interdependent knowledge in the discipline «Organization of Scientific and Innovative Activities», the level of which is determined by the target setting to each specific topic;*
- *ensuring creative work of PhD students together with the teacher during the lecture;*
- *education of PhD students' professional and business qualities and development of their independent creative thinking;*
- *formation of PhD students' necessary interest and directing for independent work;*
- *teaching research materials in a clear and high-quality language with observance of structural and logical connections, clarification of all newly introduced terms and concepts;*
- *accessibility for perception by the audience.*

№	The title of the lecture topic and the list of main issues (list of teaching tools, references to literature and tasks for the ISW)	Hours
1	***The essence of the basic concepts of innovation activity*** *Classification of innovations. The main stages and stages of the innovation process. General characteristics of models of the innovation process.* *Literature: [1] p. 7-47; [2] p. 12-20.* *Tasks for the SRS. Models of innovation diffusion.*	**2**
2	***Formation and essence of innovation theories*** *Modern concepts of innovative development. Formation and trends of the new economy. Development of knowledge-intensive high-tech industries and markets.* *Literature: [2] p. 21-33; [5] p. 26-34.* *Tasks for the SRS. Market of innovations.*	**2**
3	***Characteristics of the innovation process*** *The essence and purpose of the innovation process. Phase diagram of the innovation process. Features of organizations of the innovation process.* *Literature: [2] p. 34-39; [5] p. 56-76.* *Tasks for the SRS. The life cycle of innovation.*	**2**
4	***Types of innovation structures and their characteristics*** *Features of building organizational structures of R&D. The main types of organizational structures of R&D. The main methods of organizing the innovation process.* *Literature: [1] p. 118-134; [6] p. 162-188.* *Tasks for the SRS. Causes and sources of innovative ideas.*	**2**
5	***Innovative scientific and technical structures*** *Technopolis as an economic means of introducing innovations. Innovative essence of technopark structures and principles of their creation. Business incubators, their role and importance. The role of venture capital business in the development of innovation. Venture financing. Business planning of innovation activities.* *Literature: [2] p. 89-112.* *Tasks for the SRS. Innovation management in firms in Japan and the USA.*	**2**

6	***Management of innovations in the field of knowledge-intensive technologies*** *Technological forecasting. Foresight. Stages of Foresight development. Foresight principles. Methods of Foresight.* *Literature: [1] p. 323-336; [3] p. 47-56.* *Tasks for SRS. Scenario planning algorithm.*	***2***
7	***Basics of classification of innovations*** *The concept of technology and its types. Management of production technologies. The effect of innovative technologies on the foreign market. Characteristics of the world technology market.* *Literature: [2] p. 40-65.* *Tasks for the SRS. Planning of innovation processes.*	***2***
8	***The concept of an innovative project and its management*** *The essence of the innovation project and its content. Development of the concept of an innovative project. Planning an innovative project. Organization of innovation program management. Organization of control and regulation of the program.* *Literature: [1] p. 163-187; [5] p. 189-216.* *Assignments for the SRS. Motivation and stimulation of innovation activity.*	***2***
9	***Assessment of risks of innovation activity*** *Innovation and risk: problems and methods of assessment. Comparative analysis of methods of quantitative risk assessment. Risk assessment in the selection of partners in the implementation of innovative projects.* *Literature: [1] p. 195-231; [5] p. 217-241.* *Tasks for the SRS. Methods of uncertainty analysis.*	***2***
10	***The role of the state in creating a mechanism for regulating innovation*** *State innovation policy. State control in the field of innovation. State regulation of international innovation activity.* *Literature: [1] p. 81-117; [2] p. 71-78.* *Assignment for the SRS. The impact of tax measures on innovation.*	***2***
11	***Patents and licenses*** *The concept and economic content of patents and licenses. International patent system and basic principles of building national patent systems. Restrictive practices in the field of technology transfer. Liability for patent infringement.* *References: [2] p. 126-136.* *Tasks for the SRS. Legal protection of technical solutions.*	***2***
12	***Patent and licensing activities in Ukraine*** *Organizational structure of the patent system of Ukraine. Legal framework of the national patent system. Practical aspects of intellectual property protection.* *References: [2] p. 138-156; [5] p. 114-120.* *Assignments for the SRS. Licensing and legal procedure of technology transfer.*	***2***

13	***Information resources in innovation activity*** *Management decisions. The concept of innovative resources of information technology. Information products and services. Information support of innovation policy. Management decision and characterization of ways of its adoption in innovation management.* *References: [1] p. 315-323; [2] p. 165-171.* *Tasks for the SRS. Monitoring of innovations.*	***2***
14	***Expertise of innovation projects*** *Tasks and basic methods of innovation project evaluation. Methods for choosing the optimal innovation project. Indicators of profitability of innovative projects. Ways to reduce risk when implementing innovations.* *References: [2] p. 170-181.* *Task for the SRS. Environmental innovation and investment project.*	***2***
15	***Economic efficiency of innovations*** *Approaches and indicators for assessing the economic efficiency of innovations. Economic efficiency of production and implementation of innovations. Efficiency of purchasing innovations.* *Literature: [1] p. 280-313; [2] p. 182-189; [4] p. 227-250.* *Assignment for the SRS. Types of effects of innovation activity.*	***2***
16	***Scientific partnership*** *Ethical principles in scientific partnership. Analysis of scientific networks through co-authorship of publications. Partners and executors of the research project. Formation of a scientific project team. International scientific partnership and professional growth of a scientist.* *Literature: [7] p. 59-93.* *Tasks for the SRS. Conflict management in a research project team.*	***2***
17	***Financing and lending for innovative activities*** *The essence, principles, purpose and objectives of the system of financing scientific, technical and innovative activities. Financing the creation and operation of technology parks and other innovative structures. Directions of financial and credit support for innovation activities.* *Literature: [1] p. 265-279; [4] p. 199-216, [7] p. 197-216.* *Assignment for the SRS. Venture capital funds as a source of financing of innovation activities.*	***2***
18	***The concept of a grant*** *Grantology as a field of knowledge. Grantology as a field of practice. Development of ideas about the grant in domestic legislation. Classification of grants. Grant programs.* *Literature: [8] p. 4-31.* *Tasks for the SRS. Errors in the preparation of grant applications.*	***2***
	Total	***36***

Practical training

In the system of professional training of doctoral students in this discipline, practical classes account for 33% of the classroom hours. As a supplement to the lecture course, they lay down and form the basis for the qualification of a Doctor of Philosophy in the field of ecology, namely, innovative activity in scientific research. The content of these classes and the methodology of their conduct should ensure the development of creative activity of the individual. They develop the ability to use special terminology, allow you to test your knowledge, so this type of work is an important means of prompt feedback. Practical classes should perform not only cognitive and educational functions, but also contribute to the growth of graduate students as creative workers in the field of environmental protection.

The main objectives of the cycle of practical classes are:

- *to help postgraduate students systematize, consolidate and deepen their theoretical knowledge in the field of research and innovation;*
- *- to promote a deeper understanding of the forms of innovation, methods of their creation and ways of implementation;*
- *- to master practical methods of innovation management, organization, planning, financing and evaluation of innovation activities;*
- *- to develop the ability to learn independently, i.e. to master the methods, ways and techniques of self-study, self-development and self-control.*

№	*The title of the topic of practical classes and the list of main issues (list of teaching tools, references to literature and tasks for the ISW)*	*Hours*
1	***Innovation process and innovation activity*** *The essence of the innovation process. Stages of the innovation process. The essence of scientific, scientific and technical, innovative activity. Sources and causes of innovative ideas. The priority importance of basic science in the development of innovation.* *Literature: [1] p. 7-47.*	*2*
2	***Organizational forms of innovation implementation*** *Organizational structures for supporting innovative entrepreneurship (business incubator). Organizational forms of integration of science and industry (regional science and technology center, technology park, technopolis).* *Literature: [4] p. 156-196.*	*2*
3	***Innovation management system*** *Concept, tasks, subjects and objects of innovation management. Mechanism of innovation management. Development of the concept of innovation strategy. Innovation potential.* *Literature: [4] p. 123-146.*	*2*
4	***Innovation project management*** *Program-targeted management of innovations. Organization of management of target programs. Project management. Formation of a calendar plan and development of network models. The critical path method. Resource planning and cost analysis of the innovation program. Control and regulation of the program.* *Literature: [1] p. 163-187.*	*2*

5	***Risk management in research and innovation activities*** *The concept of uncertainty and risk. Risks of innovation and their classification. Features of taking into account the risk of innovation.* *Literature: [1] p. 195-231.*	***2***
6	***State regulation of innovation activity*** *The essence and objectives of the state innovation policy. Methods and tools of state regulation of innovation activity.* *Literature: [4] p. 266-287.*	***1***
7	***Issues of intellectual property protection in research and innovation activities*** *The structure of intellectual property. Criteria for patentability of the invention. Problems of the national patent system of Ukraine.* *Literature: [2] p. 126-156.*	***1***
8	***Evaluation of the effectiveness of innovation activity*** *Principles of evaluation and indicators of innovation activity efficiency. The main indicators of economic efficiency of innovation projects.* *Literature: [5] p. 277-281.*	***2***
9	***Financing of innovation processes*** *The financial mechanism of the scientific, technical and innovation sphere and its components. The main sources of financing, their classification features and characteristics. The impact of science expenditures on its role in the socio-economic development of the country. Financing of innovations.* *Literature: [1] p. 265-279.*	***2***
10	***Pass***	***2***
	Total	***18***

6. Self-study

Independent work takes up 55% of the credit module study time, including preparation for the test. The main task of independent work of postgraduate students is to master scientific knowledge in areas not included in the list of lecture topics through personal search for information, the formation of an active interest in a creative approach to academic work. In the process of independent work within the educational component, a graduate student must master the tools and technologies for managing research and innovation activities, including applied research, experimental development, as well as activities that ensure the creation of innovations - scientific and technical services, marketing research, organizational and financial activities.

№	***Topic title for self-study***	***Hours***
Section 1. Essential characteristics of innovations and innovation processes		
1	*Innovative and creative development of civilization. Essential characteristics and classification of innovations. Strategic and breakthrough innovations and their impact on the economy. The Global Innovation Index. The innovation process and its components. The innovation process and its components. The innovation cycle. Models of open and closed innovation. Innovation management and innovation management: the relationship of concepts. Conditions for the emergence of demand for innovation. Planning and organization of new product creation. Types*	*20*

	of demand for innovation and factors influencing it. Assessment of supply and demand for innovation. Influence of factors on the formation and consumption of innovations. Problems of formation of the market for innovative products.	
Section 2. Scientific, technical, technological innovations and changes		
2	*Project management of the innovation process and the innovation project management scheme. Comparative characteristics of the parallel, sequential and parallel-serial scheme of implementation of innovative projects. Criteria for evaluation and selection of innovative projects. Approaches to their calculation and analysis. The essence of forecasting the life cycle of an innovative project, its main methods and their comparative analysis. Analysis of risks associated with delays in the stages of the innovation cycle.*	*10*
Section 3. Public management of innovations and changes		
3	*Regulatory and legislative acts in innovation activities. State scientific, technical and industrial policy. Directions of sectoral innovation development. Types of scientific, design and innovation organizations, features of management in scientific organizations.*	*4*
Section 4. The essence and features of patent and license trade		
4	*Characterization of methods of restricting competition used in the international technology market. "Patent pool" and description of its features. Principles of building national patent systems.*	*4*
Section 5. Information support of innovation processes		
5	*Fundamentals of information policy in the EU. Science, technology and innovation policy in the EU. Functions of the European Library and the European Digital Library. Activities of European institutions in the scientific, technical and innovative spheres. European technological and information initiatives to strengthen scientific, technical and innovation potential. EU legislation in the scientific, technical, innovation and information spheres.*	*4*
Chapter 6. Expertise and economic efficiency of innovation projects		
6	*Quality management of innovations. Quality management system. Indicators for assessing the quality of R&D. Quality management of innovation proposals. Standards in the field of innovation quality. Efficiency of innovation activity. Evaluation of scientific, technical, social and economic effects. Overall economic efficiency of innovations. Evaluation of the effectiveness of licenses.*	*8*
Chapter 7. Scientific partnership and financing of innovative scientific activities		
7	*Transition from individual project management to program and portfolio management. Managing relationships with project stakeholders. Project knowledge management. Training and retraining of personnel in innovative activities, training of target teams to manage the implementation of specific business projects. Coordination system for regulating the development of scientific, technical and innovation activities.*	*10*
6	*Preparation for the pass*	*6*
	Total	*66*

Ensuring program outcomes by parts of the educational component

Title of EC	*Lectures*	*Practical and laboratory classes, individual assignments*
To deeply understand the conceptual principles and methodology of the natural sciences, formulate and test hypotheses, use appropriate evidence to substantiate conclusions, in particular, the results of theoretical analysis, experimental research and mathematical and/or computer modeling to solve significant scientific and applied environmental problems	*Lecture 3. Characteristics of the innovation process* *Lecture 4. Types of innovation structures and their characteristics* *Lecture 5. Innovative scientific and technical structures*	*Practical training 2. Organizational forms of innovation implementation* *Practical training 3. Innovation management system*
To freely present and discuss in the state and foreign languages in compliance with the norms of academic ethics the results of research, scientific and applied problems in ecology, environmental protection and optimization of nature management, to qualitatively reflect the results of research in scientific publications in leading domestic and international scientific journals	*Lecture 16. Scientific partnerships* *Lecture 17. Financing and crediting of innovative activities* *Lecture 18: The concept of a grant*	*Practical training 8. Evaluation of the effectiveness of innovation activity* *Practical training 9. Financing of innovation processes*
To develop and implement scientific and/or innovative engineering projects that allow to rethink the existing and create new holistic knowledge and/or professional practice, taking into account social, ethical, economic, environmental and legal aspects	*Lecture 8. The concept of an innovation project and its management* *Lecture 9: Risk assessment of innovation activities* *Lecture 13: Information resources in innovation activities* *Lecture 14. Expertise of innovative projects* *Lecture 15. Economic efficiency of innovations*	*Practical training 4. Innovation project management* *Practical training 5. Risk management in research and innovation activities*
To apply modern tools and technologies for searching, processing and analyzing information on environmental problems and related issues, in	*Lecture 1: The essence of the basic concepts of innovation activity* *Lecture 2. Formation and essence of innovation theories*	*Practical training 1. Innovation process and innovation activity*

particular, statistical methods for analyzing large and/or complex data, specialized databases and information systems		
To have up-to-date conceptual knowledge and a high methodological level in the field of ecology and on the border of subject areas, as well as research skills sufficient to conduct scientific and applied research at the level of the latest world achievements	*Lecture 6. Management of innovations in the field of science-intensive technologies* *Lecture 7. Basics of classification of innovations*	
To know the priority state directions of development of science, engineering and technology in the professional and related fields	*Lecture 10. The role of the state in creating a mechanism for regulating innovation*	*Practical training 6. State regulation of innovation activity*
To demonstrate awareness of up-to-date strategies for environmental protection, environmental legislation, regulations on environmental protection	*Lecture 11. Patents and licenses* *Lecture 12: Patent and license activities in Ukraine*	*Practical training 7. Issues of intellectual property protection in research and innovation activities*

Policy and Assessment

7. Course policy

Rules of attendance and behavior in the classroom

Class attendance is a mandatory component of the evaluation. Doctoral students are obliged to actively participate in the educational process, not to be late for classes and not to miss them without a sound reason, not to interfere with the teacher to conduct classes, not to be distracted by activities not related to the educational process.

Rules for assigning incentive and penalty points

- *incentive points can be awarded by the teacher exclusively for the creative works in the discipline or additional completion of online specialized courses with the receipt of the respective certificate:*
- *https://www.coursera.org/learn/scientific-approach-innovation-management;*
- *https://courses.prometheus.org.ua/courses/course-v1:Prometheus+DTI101+2017_T3/about.*

Their amount cannot exceed 10% of the rating scale.

- *penalty points within the discipline are not provided.*

Policy of deadlines and repeating an examination

In case of arrears from the academic discipline or any force majeure circumstances, PhD students should contact the teacher through the available (provided by the teacher) communication channels to resolve problematic issues and agree on the algorithm of actions for practice.

Policy of academic integrity

Plagiarism and other forms of dishonesty are not allowed. Plagiarism includes the lack of links when using printed and electronic materials, citations, opinions of other authors. Hints and copy-offs during tests, classes; passing a test for another student; copying of materials protected by the copyright system without the permission of the author of the work are unacceptable.

The policy and principles of academic integrity are defined in Section 3 of the Code of Honor of the National Technical University of Ukraine " Igor Sikorsky Kyiv Polytechnic Institute". Details: https://kpi.ua/code

Policy of academic behavior and ethics

PhD students must be tolerant, respect the opinions of others, formulate objections in the correct form, constructively provide feedback in class.

Norms of ethical behavior of PhD students and employees are defined in Section 2 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". Details: https://kpi.ua/code

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

Distribution of study time by types of classes and tasks in the discipline in accordance with the working curriculum:

Semester	Study time		Distribution of study hours				Control measures		
	Credits	acad. hours	Lecture	Practical	Lab. work	ISW	MCW	HCW	Semester control
4	4	120	36	18	–	66	–	–	pass

A PhD student's rating in a credit module is based on the points he or she receives for work in practical classes.

Semester control is a test.

The system of rating (weight) points and evaluation criteria

Rating points system and evaluation criteria:

Performing assignments in the practical classes.

The weighting score for practical classes:

1) *1 and 2 is 15 points each;*
2) *for practical classes 3-9 - 10 points each.*

Grading criteria for the practical task

Completeness and signs of task completion	***Score***	
The task is fully completed	*15*	*10*
Minor errors in p. 1	*13-14*	*8-9*
Failure to complete the assignment on time	*10-12*	*7*
Failure to complete the assignment on time, errors in p. 1	*2-9*	*2-6*
Poor execution of the task	*1*	*1*
Failure to complete the task	*0*	*0*

Thus, the semester rating scale for the credit module is

$$R = 2 - 15 + 7 - 10 = 100 \text{ points}$$

Based on the results of study in the first 7 weeks, an "ideal doctoral student" should score 40 points. At the first certification (week 8), a graduate student receives a "passed" if his or her current rating is at least 20 points.

Based on the results of study for 13 weeks of study, an "ideal doctoral student" should score 90 points. At the second certification (week 14), a graduate student receives "passed" if his or her current rating is at least 40 points.

The maximum number of points is 100. To receive "passed" for a credit module "automatically", one must have a rating of at least 60 points.

A prerequisite for admission to the test is a rating of at least 40% of the rating scale (R), i.e. 40 points.

PhD students who have gained a rating of less than 0.6 R during the semester, as well as those who want to improve their overall rating, take a test. In this case, all the points they received during the semester are canceled. The quiz tasks contain questions related to different sections of the credit module. The list of test questions is provided in Section 9.

To obtain a credit grade, the sum of all rating points R received during the semester is converted according to the table

Score	***Grade***
95...100	*Excellent*
85...94	*Very good*
75...84	*Good*
65...74	*Satisfactory*
60...64	*Sufficient*
RD <60	*Fail*
Admission conditions not met	*debarred*

9. Additional information about the course

An approximate list of questions for semester control

1. *Provide the classical classification of innovations by J. Schumpeter and its significance.*
2. *Describe innovation activity, its objects and directions.*
3. *Explain the relationship between innovation and economic growth at the micro, macro and global levels.*
4. *Describe the structures of the innovation process.*
5. *Provide models of the innovation process, their essence and development.*
6. *Provide an essential characterization of the stages of the innovation process.*
7. *Explain the purpose and objectives of innovation management.*
8. *Provide the organizational structures of innovation management.*
9. *Compare the organizational forms of integration of science and production.*
10. *Explain the essence of strategic planning of innovation activities.*
11. *Provide the types of innovation strategies and methods of choosing an innovation strategy.*
12. *Describe the current planning of innovation activities.*
13. *Compare organizational forms of innovation management.*
14. *Explain the essence of personnel management in an innovative organization.*
15. *Assess the motivation and stimulation of innovation.*
16. *Explain the concept of an innovative project, its types, objectives and participants.*
17. *Explain the essence of the life cycle of an innovative project.*
18. *Explain the essence of managing the implementation of an innovative project.*

19. *Explain the essence of risk management in innovation.*
20. *Provide the types of effects of innovation.*
21. *Describe the methods of evaluating the effectiveness of innovation activities of the organization.*
22. *Explain the concept and types of state innovation policy.*
23. *Describe the directions of state innovation policy.*
24. *Compare the methods of state stimulation of innovation.*
25. *Describe the essence and components of the innovation management system.*
26. *Provide the features of strategic management of innovation.*
27. *Describe the plans and programs of innovation activities, their resource support.*
28. *Explain the nature and components of operational management of innovation activities.*
29. *Describe scientific organizations and their classification.*
30. *Describe the innovation infrastructure and the specifics of its functioning.*
31. *Describe the market subjects of innovation activity.*
32. *Compare the types of integration formations of science and industry.*
33. *Explain the importance of information support in innovation.*
34. *The main sources of innovative information.*
35. *Describe the general scheme of innovation monitoring.*
36. *Provide methods for assessing the state of information support for innovation.*
37. *Describe the system of financing innovation at the state level.*
38. *Specify the main sources of financing of innovative projects.*
39. *Provide the essential characteristics of the innovation project.*
40. *Provide methods of managing innovative projects.*
41. *Explain the procedure for justifying and evaluating project performance.*
42. *Explain the essence of project structuring and budgeting.*
43. *Explain the essence of project risk management.*
44. *Describe the principles and criteria for evaluating the effectiveness of innovation.*
45. *Evaluate the methodological approaches to assessing the social and environmental performance of innovation activities.*
46. *Describe the indicators for assessing the social effectiveness of innovation.*
47. *Provide the main indicators of environmental performance of innovative projects.*
48. *Describe the commercial forms of technology transfer and their advantages.*
49. *Provide the key factors and prerequisites for commercialization.*
50. *Describe the factors of successful commercialization of the results of innovation activities.*

Syllabus of the course:

Designed *by D.Sc, Associate Professor Oleksandr Khokhotva*

Adopted *by Department of Ecology and Plant Polymers Technology (protocol № 17 dated 23.05.2024)*

Approved *by the Methodology Board of the Faculty (protocol № 11 dated 28.06.2024)*