



COURSE TITLE

Organization of scientific and innovative activities

Work program of the discipline (Syllabus)

Details of the discipline	
Level of higher education	<i>First (bachelor's) / Second (master's) / Third (educational and scientific)</i>
Branch of knowledge	<i>13 Mechanical engineering¹</i>
Specialty	<i>133 Industrial engineering</i>
Educational program	<i>Industry engineering</i>
Discipline status	<i>Normative</i>
Form of study	<i>full-time (day) / full-time (evening) / part-time / remote / mixed</i>
Year of preparation, semester	<i>1 course, spring semester</i>
The scope of discipline	<i>4 (120)</i>
Semester control / control measures	<i>Test</i>
Timetable	<i>3 hours per week (2 hours of lectures and 1 hour of practical classes)</i>
Language of instruction	<i>Ukrainian</i>
Information about course leader / teachers	Lecturer: Ph.D., Professor Victor Mykolayovych Marchevsky, <u>vmarchevsky@gmail.com</u> Practical Ph.D., Professor Victor Mykolayovych Marchevsky, <u>vmarchevsky@gmail.com</u>
Teacher profile	<u>vmarchevsky@gmail.com</u>
Course placement	<u>http://ci.kpi.ua</u>

Curriculum of the discipline

1. Description of the discipline, its purpose, subject of study and learning outcomes

Science as a system of knowledge that reveals the patterns of development of nature and society and ways to influence the world around us, originated in the ancient world in connection with the needs of social practice. In its current forms, science began to take shape in the XVI-XVII centuries, and to this day has become a productive force that determines the level, prospects and effective ways of social and economic development of each individual enterprise, state and humanity as a whole.

¹ In the fields Field of knowledge / Specialty / Educational program:

At the same time, the social welfare of citizens and economic development of the state are determined not only and not so much by the acquisition of scientific knowledge, the ability to see and successfully solve fundamental scientific problems, as the ability to derive economic benefit from 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 in the economic security of the state and its social and economic development.

In today's powerful globalization, education, science, innovation are the determining factors to ensure the innovative development of society and the state, to create conditions for rapid market growth through technology upgrades and the teacher justifies the need to study the discipline, should I teach this discipline? "defines the purpose, subject of the discipline and program results² **teaching** (competencies, knowledge, skills, abilities, experience, sequence of actions in standard production situations, etc.), which the student / graduate student will acquire after studying the discipline with the division into separate educational components (if the discipline is studied for several semesters)

2. Prerequisites and postrequisites of the discipline (place in the structural and logical scheme of education according to the relevant educational program)

Study of the discipline «**Organization of scientific and innovative activities**»Is based on the principles of integration of various knowledge acquired by graduate students during the master's program" Project and Grant Management ", "Marketing of startup projects", As well as in the study of disciplines" Foreign language for scientific activity ", " Philosophical principles of scientific activity ", " Methodology of scientific research ". Discipline «**Organization of scientific and innovative activities**»Provides the study of disciplines "Research of processes in machines and devices of CPV", execution and preparation of the dissertation for defense.

3. The content of the discipline

Section 1. Essential characteristics of innovations and innovation processes

Topic 1. The essence of the basic concepts of innovation

Topic 2. Formation and essence of innovative 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 and technical, technological innovations and changes

Topic 7. Fundamentals of classification of innovations

Topic 8. The concept of innovative project and its management

Topic 9. Risk assessment of innovation

Section 3. Public Administration of Innovation and Change

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

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

Topic 11. Patents and licenses

Topic 12. Patent and licensing activities in Ukraine

Section 5. Information support of innovation processes

Topic 13. Information resources in innovation

Section 6. Expertise and economic efficiency of innovative projects

Topic 14. Examination of innovative projects

Topic 15. Economic efficiency of innovation

Section 7. Scientific partnership and financing of innovative scientific activity

² For normative disciplines it is indicated according to the matrix of correspondence of program competencies and learning outcomes in the educational program.

Topic 16. Scientific partnership

Topic 17. Financing and lending for innovation

Topic 18. The concept of grant

4. Training materials and resources

Basic literature

1. *Innovation management: textbook. manual / L.I. Muxajlova, O.I. Gutorov, SG Turchina, IO Sharko. - View. 2nd, ext. - Kyiv: Center for Educational Literature, 2015. - 234 p.*
2. *Shevchenko LS Strategic innovation management: textbook. way. Kharkiv: Nat. jurid. Yaroslav the Wise University, 2019. 155 p.*
3. *Innovative development of the enterprise: textbook. aid./ Pugach AM, Demchuk NI, Dovgal OV, Kryuchko LS, Tyaglo NV– FOP Shvets VM, 2018. - 348 p.*

Additional literature

4. *Fundamentals of methodology and organization of scientific research: Textbook. way. for students, cadets, graduate students and adjuncts / ed. AE Konversky. - Kyiv: Center for Educational Literature, 2010. - 352 p*
5. *Kraus N.M. Methodology and organization of scientific research: educational and methodical manual / N.M. Kraus. - Poltava: Oriana, 2012. - 183 p.*
6. *Mykytyuk PP, Innovative activity: Textbook. settlement / PP Mykytyuk, BG Seniv - K .: Center for Educational Literature, 2009. - 392 p.*
7. *.Dudar TG, Melnichenko VV Innovation management: textbook. way. - Ternopil: Economic Thought, 2008. - 250 p.*
8. *Bondar OV, Glebova AO Innovation management - textbook. manual - 2012.*
9. *Bennett LM, Gadlin H., Levine-Finley S .. Collaboration and Team Science: A Field Guide. National Institutes of Health. 2010. 68 p.*
10. *Deeva EM Methodology of preparation and procedure for writing a grant application / EM Deeva, VG Tronin. - Ulyanovsk: UISTU, 2012. - 125 p.*

Information resources on the Internet

11. [Ministry of Environmental Protection and Natural Resources of Ukraine - https://mepr.gov.ua/](https://mepr.gov.ua/)
12. <https://do.ipk.kpi.ua/course/view.php?id=3783>

educational content

5. Methods of mastering the discipline (educational component)

information (by sections, topics) about all training sessions

Lectures

Lectures are aimed at:

- providing modern knowledge in the discipline "Organization of scientific and innovative activities", the level of which is determined by the target setting for each specific topic;
- providing creative work of postgraduate students together with the teacher during the lecture;
- education of postgraduate students of professional and business qualities and development of their independent creative thinking;
- formation of the necessary interest in graduate students and providing direction for independent work;
- teaching materials in clear and high-quality language with observance of structural and logical connections, explanation of all newly introduced terms and concepts;
- accessibility for perception by this audience.

№ s / n	Title of the lecture topic and list of main questions (list of teaching aids, references to literature and tasks on VTS)	Hours
1	<p>The essence of the basic concepts of innovation Classification of innovations. The main stages and stages of the innovation process. General characteristics of innovation process models. Literature: [1] p. 7-47; [2] c. 12-20. Tasks on VTS. Models of innovation dissemination.</p>	2
2	<p>Formation and essence of innovative 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] c. 36-65. Tasks on VTS. Innovation market.</p>	2
3	<p>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. Tasks on VTS. Life cycle of innovations.</p>	2
4	<p>Types of innovation structures and their characteristics Features of building organizational structures of R & D. The main types of organizational structures of R & D. Basic methods of organizing the innovation process. Literature: [1] p. 118-134. Tasks on VTS. Reasons and sources of innovative ideas.</p>	2
5	<p>Innovative scientific and technical structures Technopolis as an economic means of innovation. Innovative essence of technopark structures and principles of their creation. Business incubators, their role and significance. The role of venture business in the development of innovation. Venture financing. Business planning of innovation activity. Literature: [2] p. 89-112.</p>	2

	<i>Tasks on VTS. Innovation management in companies in Japan and the United States.</i>	
--	---	--

6	<p>Management of innovations in the field of science-intensive technologies Technological forecasting. Foresight. Stages of development of Forsyth. Forsyth Principles. Forsythe methods. Literature: [1] p. 323-336; [3] c. 47-56. Tasks on VTS. Scenario planning algorithm.</p>	2
7	<p>Fundamentals of classification of innovations The concept of technology and its types. Production technology management. The effect of the entry of innovative technologies into foreign markets. Characteristics of the world technology market. Literature: [2] p. 49-65. Tasks on VTS. Planning of innovation processes.</p>	2
8	<p>The concept of innovative project and its management The essence of the innovative project and its content. Development of the concept of the innovative project. Innovation project planning. Organization of management by an innovative program. Organization of control and regulation of the program. Literature: [1] p. 163-187; [5] c. 126-155. Tasks on VTS. Motivation and stimulation of innovative activity.</p>	2
9	<p>Risk assessment of innovation activities Innovation and risk: problems and evaluation methods. Comparative analysis of methods for quantitative risk assessment. Risk assessment in the selection of partners during the implementation of innovative projects. Literature: [1] p. 195-231. Tasks on VTS. Methods of uncertainty analysis.</p>	2
10	<p>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. Literature: [1] p. 81-117; [2] c. 71-78. Tasks on VTS. The impact of tax measures on innovation.</p>	2
11	<p>Patents and licenses The concept and economic content of patents and licenses. International patent system and basic principles of building national patent systems. Restrictive practice in the field of technology transfer. Liability for infringement of patent rights. Literature: [2] p. 126-136. Tasks on VTS. Legal protection of technical solutions.</p>	2
12	<p>Patent and licensing activities in Ukraine Organizational structure of the patent system of Ukraine. Legal basis of the national patent system. Practical aspects of intellectual property protection. Literature: [2] p. 138-156. Tasks on VTS. Licensing and legal procedure for technology transfer.</p>	2

13	<p>Information resources in innovation</p> <p>Management decisions. The concept of innovative resources of information technology. Information products and services. Information support of innovation policy. Management decision and characteristics of ways to make it in innovation management.</p> <p>Literature: [1] p. 315-323; [2] c. 165-171.</p> <p>Tasks on VTS. Monitoring of innovations.</p>	2
14	<p>Examination of innovative projects</p> <p>Tasks and basic methods of examination of innovative projects. Methods of choosing the optimal innovation project. Profitability indicators of innovative projects. Ways to reduce risk in the implementation of innovations.</p> <p>Literature: [2] p. 170-181.</p> <p>Tasks on VTS. Ecological innovation and investment project.</p>	2
15	<p>Economic efficiency of innovations</p> <p>Approaches and indicators for assessing the economic efficiency of innovation. Economic efficiency of production and implementation of innovation. Efficiency of purchasing innovations.</p> <p>Literature: [1] p. 280-313; [2] c. 182-189; [4] c. 227-250.</p> <p>Tasks on VTS. Types of effects of innovation.</p>	2
16	<p>Scientific partnership</p> <p>Ethical principles in scientific partnership. Analysis of scientific networks through co-authorship of publications. Partners and executors of the research project. Formation of a research project team. International scientific partnership and professional growth of a scientist.</p> <p>Literature: [7] p. 13-55.</p> <p>Tasks on VTS. Conflict management in a research project team.</p>	2
17	<p>Financing and lending for innovation</p> <p>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 innovation structures. Directions of financial and credit support of innovative activity.</p> <p>Literature: [1] p. 265-279; [4] c. 199-216.</p> <p>Tasks on VTS. Venture funds as a source of funding for innovation.</p>	2
18	<p>The concept of grant</p> <p>Grantology as a field of knowledge. Grantology as a field of practice. Development of ideas about the grant in the domestic legislation. Classification of grants. Grant programs.</p> <p>Literature: [8] p. 5-64.</p> <p>Tasks on VTS. Errors in making grant applications.</p>	2
	Total	36

Practical training

In the system of professional training of graduate students in this discipline, practical classes make up 33% of the classroom workload. As a supplement to the lecture course, they lay and form the

foundations of the qualification of Doctor of Philosophy in the field of ecology, namely innovation in research. The content of these classes and methods of conducting them should ensure the development of creative activity of the individual. They develop the ability to use special terminology, allow you to test knowledge, so this type of work is an important means of operational feedback. Practical classes should perform not only cognitive and educational functions, but also promote the growth of graduate students as creative workers in the field of environmental protection.

The main tasks of the cycle of practical classes:

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

№ s / n	The name of the topic of the practical lesson and a list of basic questions (list of didactic support, references to literature and tasks on VTS)	Hours
1	<p>Innovation process and innovation activity</p> <p>The essence of the innovation process. Stages of the innovation process. The essence of scientific, scientific and technical, innovative activities. Sources and reasons for innovative ideas. Priority importance of basic science in the development of innovations.</p> <p>Literature: [1] p. 7-47.</p>	2
2	<p>Organizational forms of innovation implementation</p> <p>Organizational structures for supporting innovative entrepreneurship (business incubator). Organizational forms of integration of science and production (regional science and technology center, technopark, technopolis)</p> <p>Literature: [4] p.156-196.</p>	2
3	<p>Innovation management system</p> <p>Concepts, tasks, subjects and objects of innovation management. Innovation management mechanism. Development of the concept of innovation strategy. Innovative potential.</p> <p>Literature: [4] p. 123-146.</p>	2
4	<p>Innovation project management</p> <p>Program-targeted innovation management. Organization of management of target programs. Project management. Formation of the calendar plan and development of network models. Critical path method. Resource planning and cost analysis of the innovation program. Control and regulation of the program.</p> <p>Literature: [1] p. 163-187.</p>	2
5	<p>Risk management in research and innovation</p> <p>The concept of uncertainty and risk. Risks of innovation activity and their classification. Features of risk accounting for innovation.</p> <p>Literature: [1] p. 195-231.</p>	2
6	<p>State regulation of innovation</p>	1

	<i>The essence and objectives of state innovation policy. Methods and tools of state regulation of innovation. Literature: [4] p. 266-287.</i>	
7	<i>Issues of intellectual property protection in research and innovation</i> <i>The structure of intellectual property. Criteria for patentability of the invention. Problems of the national patent system of Ukraine. Literature: [2] p. 126-156.</i>	1
8	<i>Evaluation of the effectiveness of innovation</i> <i>Principles of evaluation and indicators of efficiency of innovative activity. The main indicators of economic efficiency of innovative projects. Literature: [5] p. 200-212.</i>	2
9	<i>Financing of innovation processes</i> <i>The financial mechanism of scientific, technical and innovative spheres and its components. The main sources of funding, their classification features and characteristics. The impact of science spending on its role in the socio-economic development of the country. Financing of innovations. Literature: [1] p. 265-279.</i>	2
10	Test	2
	Total	18

6. Independent work of a student / graduate student

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

<i>№ s / n</i>	<i>The name of the topic that is submitted for independent study</i>	<i>Number of hours of VTS</i>
Section 1. Essential characteristics of innovations and innovation processes		
1	<i>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. Innovation process and its components. Innovation process and its components. Innovation cycle. Models of open and closed innovations. 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 of demand for innovation and factors influencing it. Evaluation of supply and demand for innovation. Influence of factors on the formation and consumption of innovations. Problems of market formation of innovative products.</i>	20

Section 2. Scientific and technical, technological innovations and changes		
2	<i>Project management of innovation process and scheme of innovation project management. Comparative characteristics of parallel, sequential and parallel-sequential 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.</i>	10
Section 3. Public Administration of Innovation and Change		
3	<i>Regulations and legislation in innovation. State scientific, technical and industrial policy. Directions of branch innovative development. Types of scientific, design and innovation organizations, features of management in scientific organizations.</i>	4
Section 4. The essence and features of patent and licensed trade		
4	<i>Characteristics of methods of restriction of competition used in the international technology market. "Patent pool" and characteristics of its features. Principles of building national patent systems.</i>	4
Section 5. Information support of innovation processes		
5	<i>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 innovative potential. EU legislation in science, technology, innovation and information.</i>	4
Section 6. Expertise and economic efficiency of innovative projects		
6	<i>Innovation quality management. Quality management system. R&D quality assessment indicators. Quality management of innovation proposals. Standards in the field of innovation quality. Efficiency of innovative activity. Evaluation of scientific and technical, social and economic effects. Overall cost-effectiveness of innovation. Evaluating the effectiveness of licenses.</i>	8
Section 7. Scientific partnership and financing of innovative scientific activity		
7	<i>Transition from managing individual projects to managing programs and project portfolios. Project stakeholder relations management. Project knowledge management. Training and retraining of personnel for innovation, training of target teams to manage the implementation of specific business projects. Coordination system for regulating the development of scientific, technical and innovative activities.</i>	10
6	<i>Preparation for the test</i>	6
	<i>Hours in general</i>	66

Policy and control

7. Course policy (educational component)

Rules for attending classes and behavior in class

Attendance is a mandatory component of assessment. Postgraduate students are obliged to take an active part in the educational process, not to be late for classes and not to miss them without good reason, not to interfere with the teacher to conduct classes, not to be distracted by actions that are not related to the educational process.

Rules for assigning incentive and penalty points

- Incentive points can be awarded by the teacher only for the performance of creative work in the discipline or additional online profile courses with a certificate:
- <https://www.coursera.org/learn/innovacionnye-proekty>;
- https://courses.prometheus.org.ua/courses/course-v1:Prometheus+DTI101+2017_T3/about.

But their amount cannot exceed 25% of the rating scale.

- penalty points within the academic discipline are not provided.

Policy of deadlines and rearrangements

In the event of arrears of the discipline or any force majeure, graduate students should contact the teacher through available (provided by the teacher) communication channels to resolve problems and agree on an algorithm for practice.

The 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. Inadmissible hints and write-offs when writing tests, conducting classes; passing the test for another graduate student; copying of materials protected by the copyright system without the permission of the author of the work.

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

Policy of academic behavior and ethics

Postgraduate students must be tolerant, respect the opinion of others, formulate objections in the correct form, constructively maintain feedback in the classroom.

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

The types of independent work (preparation for classroom classes, calculations based on primary data obtained in laboratory classes, problem solving, essay writing, calculation work, homework, etc.) and the time allotted for this are indicated.

Policy and control

8. Course policy (educational component)

The system of requirements that the teacher puts before the student / graduate student is indicated:

- rules for attending classes (both lectures and practical / laboratory);
- rules of conduct in class (activity, preparation of short reports or texts, disconnection of telephones, use of means of communication to search for information on the teacher's Google drive or on the Internet, etc.);
- rules of protection of laboratory works;
- rules for the protection of individual tasks;
- rules for assigning incentive and penalty points;
- policy of deadlines and rearrangements;
- academic integrity policy;
- other requirements that do not contradict the legislation of Ukraine and regulations of the University.

9. Types of control and rating system for evaluation of learning outcomes (RSO)

All types of control and scores for each control element are indicated, for example:

Current control: express survey, survey on the topic of the lesson, MCR, test, etc.

Calendar control: conducted twice a semester as a monitoring of the current state of compliance with the requirements of the syllabus.

Semester control: exam / test / defense of the course project (works)

Conditions of admission to semester control: minimum positive assessment for an individual task / enrollment of all laboratory works / semester rating more than XX points.

Table of correspondence of rating points to grades on a university scale:

<i>Scores</i>	<i>Rating</i>
100-95	Perfectly
94-85	Very good
84-75	Fine
74-65	Satisfactorily
64-60	Enough
Less than 60	Unsatisfactorily
Admission conditions are not met	Not allowed

10. Additional information on the discipline (educational component)

- *a list of questions to be submitted for semester control (for example, as a supplement to the syllabus);*
- *the possibility of enrollment in certificates of distance or online courses on relevant topics;*
- *other information for students / graduate students on the peculiarities of mastering the discipline.*

Work program of the discipline (syllabus):

Folded position, degree, academic title, name

Approved department _____ (protocol № ___ from _____)

Agreed Methodical commission of the faculty³ (Minutes № __ of _____)

Rules for attending classes and behavior in class

Attendance is a mandatory component of assessment. Postgraduate students are obliged to take an active part in the educational process, not to be late for classes and not to miss them without good reason, not to interfere with the teacher to conduct classes, not to be distracted by actions that are not related to the educational process.

Rules for assigning incentive and penalty points

- *Incentive points can be awarded by the teacher only for the performance of creative work in the discipline or additional online profile courses with a certificate:*
 - <https://www.coursera.org/learn/innovacionnye-proekty>;
 - https://courses.prometheus.org.ua/courses/course-v1:Prometheus+DTI101+2017_T3/about.

But their amount cannot exceed 25% of the rating scale.

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

Policy of deadlines and rearrangements

In the event of arrears of the discipline or any force majeure, graduate students should contact the teacher through available (provided by the teacher) communication channels to resolve problems and agree on an algorithm for practice.

The 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. Inadmissible hints and write-offs when writing tests, conducting classes; passing the test for another graduate student; copying of materials protected by the copyright system without the permission of the author of the work.

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

Policy of academic behavior and ethics

Postgraduate students must be tolerant, respect the opinion of others, formulate objections in the correct form, constructively maintain feedback in the classroom.

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

11. Types of control and rating system for evaluation of learning outcomes (RSO)

Distribution of study time by types of classes and tasks in the discipline according to the working curriculum:

Semester	Training time		Distribution of teaching hours				Control measures		
	Loans	acad. year	Lectures	Practical	Lab. slave.	CPC	MCR	RR	Semester control
2	4	120	36	18	-	66	-	-	test

The student's rating in the discipline consists of points that he receives for:

The graduate student's rating from the credit module consists of the points he receives for his work in practical classes.

Semester control is a test.

System of rating (weight) points and evaluation criteria

Rating points system and evaluation criteria:

Performing tasks in practical classes.

The weight score for 1 and 2 practical classes is 15 points each; in practical classes 3 - 9 - 10 points.

Criteria for evaluating the implementation of a practical task

Completeness and signs of task performance	Bali	
The task is completed in full	15	10
Minor shortcomings under paragraph 1	13-14	8-9
Late performance of the task	10-12	7
Untimely performance of the task, shortcomings under item 1	2-9	2-6
Poor task performance	1	1
Failure to complete the task	0	0

Thus, the rating semester scale of the credit module is:

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

According to the results of educational work for the first 7 weeks, the "ideal graduate student" must score 40 points. At the first certification (8th week) the graduate student receives "credited" if his current rating is at least 20 points.

According to the results of educational work for 13 weeks of study, the "ideal graduate student" must score 90 points. At the second certification (14th week) the graduate student receives "credited" if his current rating is not less than 40 points.

The maximum amount of points is 100. To get credit from the credit module "automatic" you must have a rating of at least 60 points.

A necessary condition for admission to the test is a rating of at least 40% of the rating scale (R), ie 40 points.

Postgraduate students who scored less than 0.6 R during the semester, as well as those who want to increase the overall rating, perform a test. In this case, all points obtained by them during the semester are canceled. Test tasks contain questions that relate to different sections of the credit module. The list of test questions is given in Section 9.

To obtain a credit score, the sum of all received during the semester rating points R is translated according to the table:

Scores	Rating
95 ... 100	perfectly
85 ... 94	very good
75 ... 84	fine
65 ... 74	satisfactorily
60 ... 64	enough
RD < 60	unsatisfactorily
Admission conditions are not met	not allowed

12. Additional information on the discipline (educational component)

An approximate list of questions that are submitted for semester control

1. Give the classical classification of innovations by J. Schumpeter and its significance.
2. Describe the 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. Give models of the innovation process, their essence and development.
6. Give an essential description of the stages of the innovation process.
7. Explain the purpose and objectives of innovation management.
8. Give the organizational structures of innovation management.
9. Compare organizational forms of integration of science and production.
10. Discover the essence of strategic planning of innovation
11. List the types of innovation strategies and methods of choosing an innovation strategy.
12. Describe the current planning of innovation.
13. Compare organizational forms of innovation management.
14. Explain the essence of personnel management in an innovative organization.
15. Evaluate the motivation and stimulation of innovation.
16. Discover the concept of an innovative project, its types, tasks and participants.
17. Discover 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. List the types of effects from innovation.
21. Describe the methods of assessing the effectiveness of innovation of the organization.
22. Explain the concepts and types of state innovation policy.
23. Describe the directions of the state innovation policy.

24. Compare the methods of state stimulation of innovation.
25. Describe the essence and components of the management system of innovation processes.
26. Give the features of strategic management of innovation.
27. Describe the plans and programs of innovation, their resource provision.
28. Explain the essence and components of operational management of innovation.
29. Describe scientific organizations and their classification.
30. Describe the innovation infrastructure and the specifics of its operation.
31. Describe the market subjects of innovation.
32. Compare the types of integration formations of science and production.
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. Give methods for assessing the state of information support of innovation.
37. Describe the system of financing innovation at the state level.
38. Indicate the main sources of funding for innovative projects.
39. Give the substantive characteristics of the innovation project.
40. Give methods of managing innovative projects.
41. Explain the content of the procedure for justifying and evaluating the effectiveness of the project.
42. Discover the essence of structuring and budgeting the project.
43. Discover the essence of project risk management.
44. Describe the principles and criteria for evaluating the effectiveness of innovation.
45. Evaluate methodological approaches to assessing the social and environmental effectiveness of innovation.
46. Describe the indicators for assessing the social effectiveness of innovation.
47. Give the main indicators of environmental efficiency of innovative projects.
48. Describe commercial forms of technology transfer and their benefits.
49. List the key factors and prerequisites for commercialization.
50. Describe the factors of successful commercialization of innovation results.

Work program of the discipline (syllabus):

Approved at the meeting of the Department of Machines and Apparatus of Chemical and Oil Refining (Protocol № 26 of 19 June 2021)

Agreed metodic commission of the Faculty of Engineering and Chemistry (Protocol № 11 of June 25, 2021)