



Diploma design

Work program of the discipline (Syllabus)

Details of the discipline

Level of higher education	<i>First (bachelor's)</i>
Field of study	<i>10 Natural Sciences</i>
Speciality	<i>101 Ecology</i>
Educational program	<i>Environmental safety</i>
Discipline status	<i>Normative</i>
Form of study	<i>full-time (full-time)/remote/mixed/part-time</i>
Year of preparation, semester	<i>4th year/spring semester</i>
Volume of discipline	<i>6 credits, 180 hours</i>
Semester control/control measures	<i>State certification (defense of the bachelor's diploma project)</i>
Schedule of classes	<i>Independent work of the student</i>
Language of teaching	<i>Ukrainian</i>
Information about the course instructors / teachers	
Course placement	

The program of the discipline

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

During the diploma design, the student prepares a qualification work - a bachelor's thesis project (hereinafter referred to as the "project"), which is the final stage of training at the bachelor's educational level. Based on the results of the preparation and defense of the project, the examination commission (hereinafter EC) makes a decision on awarding the student the appropriate qualification and educational degree.

The subject of the educational component "Diploma design" is the preparation of a bachelor's diploma project.

***Interdisciplinary connections.** Diploma design is based on all disciplines studied within the curriculum of the bachelor's degree.*

The purpose of the discipline "Diploma design"

*The purpose of the educational component is to form the following **competencies** among students:*

- *Knowledge and understanding of the subject area and professional activity*
- *Ability to communicate in the state language both orally and in writing*
- *Ability to evaluate and ensure the quality of work performed*
- *Ability to realize their rights and obligations as a member of society, to realize the values of a public (free democratic) society and the need for its sustainable development, the rule of law, human and citizen rights and freedoms of Ukraine*
- *Ability to preserve and increase moral, cultural, scientific values and achievements of society based on an understanding of the history and patterns of development of the subject area, its place in the general system of knowledge about nature and society and in the development of society, technology and*

technology, to use various types and forms of mobile activity for active recreation and maintaining a healthy lifestyle

- Ability to assess the impact of technogenesis processes on the state of the environment and identify environmental risks associated with production activities

- Ability to participate in the development of a management and management system for production and consumption waste

- Ability to use modern information resources for environmental research

- Ability to master international and domestic experience in solving regional and transboundary environmental problems

- Ability to participate in the management of environmental actions and/or environmental projects

- Ability to develop design and working technical documentation in the field of environmental technologies, draw up constructive schemes with elements of equipment and industrial buildings, draw up completed design and development

- Ability to improve, design, implement and operate technologies and equipment for the treatment and processing of exhaust gases, wastewater and solid waste

- Ability to develop projects for calculating the maximum permissible discharges and emissions, to control compliance with GDS, GDV standards

- Ability to distinguish between technological processes of production, determine the sources and ways of entry into the environment of harmful components, assess their impact on human health and environmental quality

According to the requirements of the program of the discipline "**Diploma Design**", students after mastering it must demonstrate the following **programmatic learning outcomes**:

- Demonstrate an understanding of the basic principles of environmental and/or environmental project management

- Understand the basic environmental laws, rules and principles of environmental protection and environmental management

- Understand the basic concepts, theoretical and practical problems in the field of natural sciences that are necessary for the analysis and decision-making in the field of ecology, environmental protection and optimal environmental management

- Use the principles of uprav linya on which the environmental safety system is based

- Identify the factors determining the formation of landewaft n o-biological diversity

- To solve problems in the field of environmental protection using generally accepted and / or standard approaches and international and domestic experience

- Be able to search for information using appropriate sources to make informed decisions

- Be able to use software, GIS technologies and Internet resources for information support of environmental research

- Be able to predict the impact of technological processes and production on the environment

- Participate in the development and implementation of projects aimed at optimal management and management of industrial and municipal waste

- Be able to convey the results of activities to a professional audience and the general public, make presentations and messages

- Be able to explain the social, economic and political consequences of the implementation of environmental projects

- To be aware of the responsibility for the effectiveness and consequences of the implementation of comprehensive environmental measures

- Participate in the development of projects and practical recommendations for environmental conservation

- Demonstrate skills in implementing environmental measures and projects

- Understand and realize their rights and obligations as a member of society, realize the values of a free democratic society, the rule of law, human and civil rights and freedoms in Ukraine

- To preserve and increase the achievements and values of society based on an understanding of the place of the subject area in the general system of knowledge, to use different types and forms of physical activity to lead a healthy lifestyle
- Apply methodologies and technologies of design, implementation and implementation of environmental technologies and equipment, carry out design activities
- To carry out technological and hydraulic calculations of sewage treatment plants, to draw up the energy and material balance of devices, to carry out parametric calculation of equipment, to choose typical structures in construction, to draw up master plans of industrial enterprises
- To assess the state of the environment, determine the level of impact of the enterprise (production) on the environment, determine the main environmental pollutants of this enterprise (production)
- Develop technologies, use processes and devices that ensure effective separation, concentration, extraction, destruction of harmful impurities in water systems and gas environments, recycling and disposal of waste.

Provision of program results by components of the educational component

Name PR	Individual task
<i>Demonstrate an understanding of the basic principles of environmental and/or environmental project management</i>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<i>Understand the basic environmental laws, rules and principles of environmental protection and environmental management</i>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<i>Understand the basic concepts, theoretical and practical problems in</i>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p>

<p><i>the field of natural sciences that are necessary for the analysis and decision-making in the field of ecology, environmental protection and optimal environmental management</i></p>	<p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Use the principles of uprav linya on which the environmental safety system is based</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Identify the factors determining the formation of landewaft n o-biological diversity</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>To solve problems in the field of environmental protection using generally accepted and / or standard approaches and international and domestic experience</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p>

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<p><i>Be able to search for information using appropriate sources to make informed decisions</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Be able to use software, GIS technologies and Internet resources for information support of environmental research</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Be able to predict the impact of technological processes and production on the environment</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p>

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<p><i>Participate in the development and implementation of projects aimed at optimal management and management of industrial and municipal waste</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>development and requirements for the characteristics of the design object</i></p> <p><i>In the selection and justification of the optimality of technical solutions or theoretical and experimental methods of research of the tasks set</i></p> <p><i>In the selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effect</i></p> <p><i>dispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Be able to convey the results of activities to a professional audience and the general public, make presentations and messages</i></p>	<p><i>Creating graphic materials for the project</i></p> <p><i>Writing and formatting an explanatory note to the project</i></p> <p><i>Preparation of a report to protect the project</i></p>
<p><i>Be able to explain the social, economic and political consequences of the implementation of environmental projects</i></p>	<p><i>Creating graphic materials for the project</i></p> <p><i>Writing and formatting an explanatory note to the project</i></p> <p><i>Preparation of a report to protect the project</i></p>
<p><i>To be aware of the responsibility for the effectiveness and consequences of the implementation of comprehensive environmental measures</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>development and requirements for the characteristics of the design object</i></p> <p><i>In the selection and justification of the optimality of technical solutions or theoretical and experimental methods of research of the tasks set</i></p> <p><i>In the selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effect</i></p> <p><i>dispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Participate in the development of projects and practical recommendations for environmental conservation</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>development and requirements for the characteristics of the design object</i></p>

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<p><i>Demonstrate skills in implementing environmental measures and projects</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Understand and realize their rights and obligations as a member of society, realize the values of a free democratic society, the rule of law, human and civil rights and freedoms in Ukraine</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>To preserve and increase the achievements and values of society based on an understanding of the place of the subject area in the general system of knowledge, to use different types and forms of physical activity to lead a healthy lifestyle</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p>

	<p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Apply methodologies and technologies of design, implementation and implementation of environmental technologies and equipment, carry out design activities</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>To carry out technological and hydraulic calculations of sewage treatment plants, to draw up the energy and material balance of devices, to carry out parametric calculation of equipment, to choose typical structures in construction, to draw up master plans of industrial enterprises</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>To assess the state of the environment, determine the level of impact of the enterprise (production) on the environment, determine the main environmental pollutants of this enterprise (production)</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p> <p><i>Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.</i></p> <p><i>Technic-economic justification of the diploma project, calculation</i></p> <p><i>economic effectPdispositions and measures to ensure labor protection, safety, environmental protection</i></p>
<p><i>Develop technologies, use processes and devices that ensure effective separation, concentration, extraction, destruction of harmful impurities in water systems and gas environments, recycling and disposal of waste.</i></p>	<p><i>Review and analysis of literary sources on the subject of the project task</i></p> <p><i>Rdevelopmentand requirements for the characteristics of the design object</i></p> <p><i>In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set</i></p>

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

Prerequisites: The study of the discipline "**Diploma Design**" is based on the principles of integration of various knowledge gained by students during the bachelor's degree.

Requisites: design and implementation of environmental protection technologies, creation of relevant documentation in the form of an explanatory note and graphic material for the project.

Contents of the course

The main objectives of the diploma design:

- systematization, consolidation and expansion of theoretical knowledge obtained in the process of studying under the bachelor's educational program "Environmental Safety", and their practical use in solving specific engineering, scientific and industrial issues in a certain field of professional activity;

- development of experience of independent work, mastering the methodology for calculating indicators of anthropogenic load, main structures and, physical or mathematical modeling, the use of modern information technologies in the process of solving problems that are provided for by the task for the project;

- determining the compliance of the level of training of the applicant for higher education with the requirements of the educational program, his readiness and ability to work independently in a market economy, modern production, the progress of science, technology and culture.

The project should be based on the knowledge and skills gained in the study of disciplines for the entire period of study at the university and may be partially based on the results of course design.

The project may involve the implementation of design and calculation work.

The topics of the projects are determined in accordance with the following areas:

- Scientific interest of the head in the field of environmental safety and environmental protection technologies;

- Research areas that the department is engaged in;

- Ensuring the educational process;

- Implementation of economic contractual topics;

- Professional interests of the executor.

It is recommended to choose topics related to the improvement of water treatment and water purification technologies, technologies for gas emissions purification, recovery and disposal of solid domestic and industrial waste, calculations of environmental quality indicators (GDV, GDS, SZZ), as well as the development of EIA and SEA projects.

The subject of the project in general is not stipulated by the above areas and can be proposed by the student within the specialty "Ecology".

Learning Materials and Resources

Basic literature

1. Law of Ukraine On Higher Education (Bulletin of the Verkhovna Rada (VVR), 2014, No. 37-38, p. 2004) Edition of 02.09.20120

2. Regulations on the final certification of students KPI them. Igor Sikorsky / Compiled by: V. P. Golovenkin, V. Y. Ugolnikov. – Kyiv, KPI them. Igor Sikorsky, 2018. – 100 p.

3. Regulations on the organization of the educational process in the KPI them. Igor Sikorsky

4. Nosachova Yu.V., Ivanenko O.I., Radovenchyk Ya.V. Fundamentals of scientific research. Kyiv: Condor Publishing House, 2020. – 294 p. 130 p.

Supporting literature

1. DSTU 2.104:2006 ESKD. *Basic inscriptions.*
2. DSTU 3321:2003. *The system of design documentation. – K.: Derzhspozhyvstandard of Ukraine, 20053. GOST*
3. DSTU 3008-95. *Documentation. Reports in the field of science and technology. Structure and rules of registration.*
4. DSTU 7525:2014 *Drinking water. Requirements and methods of quality control.*
5. DSP 201-97 *State sanitary rules for the protection of atmospheric air of populated places (from pollution by chemical and biological substances).*
6. DSTU 4462.0.01:2005 *Nature conservation. Waste management. Terms and definitions of concepts.*
7. DSTU 4462.3.02: 2006 *Nature conservation. Waste management. Packaging, labeling and disposal of waste. Rules for the transportation of waste. General technical and organizational requirements.*
8. DSanPiN 2.2.7.029-99 *Hygienic requirements for industrial waste management and determination of their class of danger to public health.*
9. DBN V.2.5-75: 2013 *Sewerage. External networks and facilities. The main provisions of the design.*
10. DSTU 8302:2015. *Information and documentation. Bibliographic reference. General provisions and rules of compilation.*

Educational content

5. Methods of mastering the discipline (educational component)

Organizationally, the project implementation process consists of the following steps:

- preparatory, which begins with the student's choice of a topic and receiving an individual assignment from the supervisor on issues that need to be considered during pre-diploma practice on the chosen topic (familiarization with the state of the problem, collecting factual materials, conducting the necessary observations, experiments, research, etc.);

- the main one, which begins immediately after the defense of the practice report and ends approximately two weeks before the project is defended, when the project is presented for preliminary protection. At this stage, the project must be fully implemented, checked by the head and reviewers, and checked for academic integrity.

- final, which includes receiving feedback from the head and review. The completed project with the response of the head is submitted by the student to the graduating department no later than one week before the day of protection. The head of the department, based on the results of the interview with the student and familiarization with the submitted materials, decides on admission to the defense and signs the title page of the student's project;

- preparation for the speech at the EC meeting and the procedure for protecting the project.

The graduation project consists of graphic material (drawings) and an explanatory note to it.

The explanatory note to the diploma project (text part of the thesis) should reveal the creative idea of the project in a concise and clear form, contain an analysis of the current state of the problem, methods for solving project problems, justification of their optimality, methods and results of calculations, description of the experiments conducted, analysis of their results and conclusions from them; contain the necessary illustrations, sketches, graphs, diagrams, tables, diagrams, figures, etc. It should be missing well-known provisions, unnecessary descriptions, derivation of complex formulas, etc.

The graphic part contains at least some of the graphic materials.

In structural terms, the student's report at the EC meeting can be divided into three parts, each of which represents an independent substantive block, but in general they are logically related and characterize the content of the study. In the first part of the report, it is necessary to present the topic of the project, to characterize the relevance of the chosen topic, to describe the problem, as well as to formulate the goals and objectives of the project. In the second part of the report, it is necessary to provide a description of each section of the project. At the same time, special attention should be paid to the methods by which the actual material and the final results were obtained. In the third part of the report it is necessary

to present general conclusions. At the time of protection, demonstration material in graphic can be additionally used, electronic (video materials, multimedia, presentations, etc.) or full-scale (models, layouts, product samples, etc.) form.

6. Independent work of a student / graduate student

Independent work takes 100% of the time to study the discipline.

No s/n	The name of the topic submitted for independent study	Number of hours of SRS
1	Review and analysis of literary sources on the subject of the project task	30
2	Rdevelopmentand requirements for the characteristics of the design object	20
3	In theselection and justification of the optimality of technical solutions or theoreticalx and experimental methods of research of the tasks set	30
4	Inthe selection and justification of possible options for technical implementation and methods for calculating the parameters of structures and their placement on the ground or in the workshop; EIA and SEA projects.	30
5	Technic-economic justification of the diploma project, calculation economic effect	30
6	Pdispositions and measures to ensure labor protection, safety, environmental protection	10
7	Creating graphic materials for the project	10
8	Writing and formatting an explanatory note to the project	10
9	Preparation of a report to protect the project	10
<i>Just</i>		180

Politics and control

7. Policy of the discipline (educational component)

Rules for assigning incentive and penalty points

Of the willing and penalty points within the educational component are not provided.

Deadline and reshuffle policy

In the event of any force majeure, students should contact the teacher through the available (provided by the teacher) communication channels to solve problematic issues and coordinate the algorithm of actions for testing.

Academic Integrity Policy

Plagiarism and other forms of dishonest work are unacceptable. Plagiarism includes the absence of references when using printed and electronic materials, quotes, opinions of other authors. It is unacceptable to copy 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 "Igor Sikorsky Kyiv Polytechnic Institute". Read more: <https://kpi.ua/code>

Academic Conduct and Ethics Policy

Students should be tolerant, respect the opinions of others, formulate objections in the correct form, constructively maintain feedback.

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

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

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

Semester	Study time		Distribution of study hours				Control measures		
	Loans	acad. H.	Lecture	Practical	Lab. Rob.	SRS	FDM	RGR	Semester control
8	6	180	-	-	-	180	-	-	State certification (defense of the bachelor's diploma project)

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

1. Quality of qualification work r_1 :

- Practical orientation of the diploma project - 10-0 points;
- Quality of feasibility study of basic decisions – 1 0-0 points;
- Modernity and originality of decisions made: 5-0 points;
- The correctness of the application of methods of analysis and calculation, their depth and compliance with the modern level - 5-0 points;
- Explanatory note quality – 10 – 0.
- Quality of graphic material – 10 – 0.
- Implementation of materials of the diploma project - 10 - 0.

2. Protection of qualification work r_2 :

The system of rating (weight) points and the criterion for evaluation

No p/n	Characteristics and evaluation criteria	McSimum
Aswell as the qualification work (maximum 60 points)		
1	<p style="text-align: center;">Practical orientation of the graduation project</p> <p>10 points – The project was completed at the request of the enterprise, institution. The terms of reference are approved by the customer.</p> <p>8-9 points – The project was executed within the framework of economic contract or state contract topics (the terms of reference for the implementation of the topic are attached).</p> <p>6-7 points – The project was carried out according to the interest of the educational process of the department. Didactic requirements for work were approved by the head of the department.</p> <p>3-5 points – The project was implemented on the basis of real initial data.</p> <p>0-2 points – The project is purely educational in nature.</p>	10
2	<p style="text-align: center;">The quality of the feasibility study of the main decisions</p> <p>10 points – At least three solutions to the problem are considered. According to a reasonably chosen criterion, the choice of the best option was made.</p> <p>6-9 points – At least two solutions to the problem are considered. The choice of a rational option is justified.</p> <p>1-5 points – The choice of solution is made on the basis of a qualitative comparison of at least two options for solving the problem.</p>	10

	<i>0 points – The uncontested decision was chosen without sufficient justification.</i>	
3	<p style="text-align: center;">Modernity and originality of decisions made</p> <p><i>5 points – Decisions were made on the basis of an analysis of the latest domestic and foreign scientific, technical and patent literature and contain original, promising ideas that were put forward by the student personally (according to the response of the head).</i></p> <p><i>3-4 points – Decisions were made on the basis of an analysis of domestic and foreign scientific, technical and patent literature and correspond to the level of promising samples.</i></p> <p><i>1-2 points – The main decisions were made without sufficient analysis of the current state of the issue and correspond to the level of modern serial samples.</i></p> <p><i>0 points – The solutions correspond to outdated samples.</i></p>	5
4	<p style="text-align: center;">The correctness of the application of methods of analysis and calculation, their depth and compliance with the modern level</p> <p><i>5 points – Methods of analysis and calculation of the developed device (systems, technologies) are selected reasonably and correspond to the modern level. The depth of analysis and calculations ensures the creation of a device (system, technology) that will correspond to the initial data for the diploma project.</i></p> <p><i>3-4 points – Methods of analysis and calculation correspond to the modern level, and their depth confirms the possibility of creating a device (system, technology) that will correspond to the initial data for the diploma project.</i></p> <p><i>1-2 points – The analysis and calculations carried out made it possible to substantiate the basic requirements for the components (elements) of the device (system, technology) that is being designed, taking into account the initial data for the diploma project.</i></p>	5
5	<p style="text-align: center;">The quality of the explanatory note</p> <p><i>10 points – Explanatory note made in Ukrainian. The material is presented clearly, concisely, competently. Registration fully complies with the requirements of regulatory documents.</i></p> <p><i>6-9 points – The material is presented clearly, concisely, but there are stylistic errors. Registration with minor deviations from the requirements of regulatory documents.</i></p> <p><i>1-5 points – The material is vaguely presented, there are grammatical errors. Registration with significant violations of regulatory documents.</i></p>	10
6	<p style="text-align: center;">The quality of graphic material</p> <p><i>10 points – Graphic material fully reveals the content of the project, made using computer graphics and in compliance with the requirements of regulatory documents.</i></p> <p><i>6-9 points – Graphic material fully reveals the content of the project, but the structure of the sheets is not optimal. Execution at a high technical level in compliance with the requirements of regulatory documents.</i></p> <p><i>1-5 points – Graphic material does not fully disclose the content of the project, there are minor deviations from the requirements of the standards. Execution at a satisfactory technical level.</i></p> <p><i>0 – Lack of graphic material</i></p>	10
7	<p style="text-align: center;">Implementation of diploma project materials</p> <p><i>10 points – One of the conditions is met:</i></p> <ul style="list-style-type: none"> <i>– received a patent of Ukraine for an invention, industrial design, utility model, or positive decision;</i> <i>– the results of the work are implemented or accepted for implementation under the relevant acts;</i> <i>– several scientific articles have been published or several reports have been made at scientific conferences (republican, international); There are abstracts of the report, copies of articles.</i> <p><i>7-9 points – One of the conditions is met:</i></p>	10

	<ul style="list-style-type: none"> – an application for a patent of Ukraine for an invention, industrial design, utility model, or industrial property object has been submitted; – presented "know-how" with a proposal and optional approval; – published article in a scientific journal; – a report was made at a scientific conference (republican, international), there are abstracts of the report; – the results of the work are accepted for use in the educational process (there is an act of the commission). <p>3-6 points – One of the conditions is met:</p> <ul style="list-style-type: none"> – issued a certificate of rationalization proposal; – a report was made at the city (university) scientific conference; – an article was published in the university scientific collection. <p>1-2 points – Recommendation of the SEC on the implementation or publication of results.</p> <p>0 points – There is no implementation of the results.</p>	
Defense of qualification work (maximum 40 points)		
8	<p>30-40 points – High level of quality of the report, fully owns the material, perfectly justifies the decisions made. The student knows how to defend his opinion.</p> <p>20-30 points – The level of quality of the answer is above average, minor gaps in the possession of the material are allowed. The student is well aware of the decisions made and knows how to defend his opinion.</p> <p>10-20 points – The average level of quality of the student's response. Not well versed in the material, the average degree of justification of the decisions made, is not good enough to defend his opinion.</p> <p>0-10 points – Low level of response quality. The student does not have enough knowledge of the material, does not substantiate the decisions made and does not know how to defend his opinion.</p>	40

The calculation of the points of the graduation project is:

$$R_{dp} = r_1 + r_2 = 10 + 10 + 5 + 5 + 10 + 10 + 10 + 40 = 100 \text{ points}$$

The sum of the points of the two components is transferred to the attestation assessment according to the table (on a university scale)

$R_{dp} = r_1 + r_2 = 10 + 10 + 5 + 5 + 10 + 10 + 10 + 40 = 100$	<i>University Scale</i>
95...100 points	<i>Perfectly</i>
85...94 points	<i>Very good</i>
75...84 points	<i>Well</i>
65...74 points	<i>Satisfactory</i>
60...64 points	<i>Enough</i>
$R_{KR} < 60$ points	<i>Disappointing</i>
Course project not allowed to defend	<i>Not allowed</i>

Work program of the discipline (syllabus):

Compiled by Candidate of Technical Sciences, Associate Professor Nosachova Yu.V.

Approved by the department E and TPP (protocol No 14 of 18.05.2023.)

Agreed by the methodical commission of the ICF (protocol No 10 of 24.05.2023)