



Ecological Safety and Civil Protection

Syllabus

Subject details

Cycle of Higher Education	<i>First (Bachelor)</i>
Field of Study	<i>12 Information technologies</i>
Speciality	<i>121 Software Engineering</i>
Education Program	<i>Software Engineering of Multimedia and Information Retrieval Systems</i>
Type of Course	<i>Normative</i>
Mode of Studies	<i>full-time</i>
Year of studies, semester	<i>1 year, 1 semester</i>
ECTS workload	<i>ECTS 2 cr. / 60 hours. 18 hours for lectures, 18 hours for practicals, 24 hours for self-study</i>
Testing and assessment	<i>Credit, modular test, calendar control</i>
Course Schedule	<i>According to http://roz.kpi.ua/</i>
Language of Instruction	<i>English</i>
Course Instructors	Lecturer: Yury Polukarov, PhD, ass. of prof. polukarov.yury@lil.kpi.ua ; https://t.me/YuryPolukarov Practical: Olena Zemlyanska, senior lecturer o_zemlyanska@i.ua ; https://t.me/o_zemlyanska
Access to the course	Educational and methodological complex on Moodle (<i>platform "Sikorsky"</i>) https://do.ipk.kpi.ua/course/view.php?id=4701

Study program

1. Subject description, objective, matter and outcome

The educational discipline belongs to the cycle of general training.

Why does a bachelor need it?

Having mastered the material of the academic discipline, students of higher education will be able to use the provisions of legislative acts and normative legal documents on environmental safety and civil protection in their professional activities; identify and classify environmental hazards; identify factors that determine the level of environmental safety; carry out an assessment of environmental and man-made safety risks; to know the algorithms of protection against harmful factors during an emergency and their impact on human health; to have the basic methods of preserving life and health, including in emergency situations. After mastering the material of the discipline, students of higher education will be able to use the knowledge of legislative, regulatory and sanitary-hygienic foundations of environmental safety and civil protection. They will also be able to choose and use means of collective and personal protection; to know the general principles of providing first aid; to know the algorithm of actions when carrying out evacuation measures. Future specialists will be able to solve complex specialized tasks and practical professional problems in compliance with modern safety requirements, which will allow them to maintain health and work capacity.

The purpose of the educational discipline is to form students of higher education relevant competencies for professional activities in the specialty with mandatory observance of the basic

principles of environmental safety and civil protection, a well-founded understanding of the importance of environmental safety and a sense of environmental responsibility; psychological readiness for safe activities in the conditions of a modern man-made environment and the ability to take purposeful actions and protection in the conditions of the occurrence of dangers; responsibility for personal and collective safety during emergency situations, special and martial law, taking into account the peculiarities of future professional activity in the primary position.

The subject of the academic discipline is legislative, regulatory, socio-economic, engineering-technical and sanitary-hygienic foundations of environmental safety and civil protection. Particular attention is paid to the analysis of the main factors that determine the level of man-made and environmental safety, as well as the rights, obligations and behavior of the population in emergency situations, special and martial law, taking into account the specifics of the requirements placed on specialists in the field of information technologies.

Study of the discipline "Ecological Safety and Civil Protection" will allow to form the following **general and professional competences:**

GC 05 Ability to learn and use modern knowledge.

GC 06 Ability to search, process and analyze information from various sources.

GC 09 Desire to preserve the environment.

GC 12 Ability to preserve and increase moral, cultural, scientific values and society achievements based on history understanding and development patterns of the subject field, its place in the nature and society knowledge general system and in the society development, to use different physical activity types and forms for active recreation and healthy living.

PC 09 Ability to estimate and take into account economic, social, technological and environmental factors affecting the field of professional activity.

Study of the discipline " Ecological safety and civil protection" forms students **program learning outcomes (PLO)** according to the educational program:

PLO01 To analyze, purposefully search and select the necessary information and reference resources and knowledge to solve professional problems, taking into account modern advances in science and technology.

PLO27 To be able to use statistical data analysis methods.

2. Prerequisites and postrequisites of the subject (its place in the structural and logical scheme of education according to the corresponding educational program)

Interdisciplinary connections: the discipline uses the achievements and methods of basic and applied sciences. In order to successfully master the discipline, it is desirable for students to have knowledge of:

- basic computer skills;
- fundamental sections of mathematics to the extent necessary for mastering the mathematical apparatus of individual topics of the discipline;
- fundamental laws of physics.

3. The content of the discipline

Table 1

Study week	The topic
1	Topic 1. National security, its directions and components
3	Topic 2. Basic principles and criteria of ecological safety
5	Topic 3. Environmental management as an integral component of a systemic approach to effective enterprise management
	Topic 4. Principles of providing first aid
7	Topic 5. State environmental monitoring system of Ukraine

	Topic 6. Risk as a quantitative assessment of dangers
9	Topic 7. Basics of civil protection of the population and territories
11	Topic 8. Emergency situations of a natural nature
13	Topic 9. Emergency situations of man-made nature
15	Topic 10. Emergency situations of a socio-political and military nature
17	Topic 11. Basic principles of rescue and emergency operations
18	Final attestation (credit)

4. Training materials and resources

Main literature

1. Ecological Safety and Civil Protection. Educational and methodological complex on Moodle (*platform "Sikorsky"*). Access to registered students. The link to the course: <https://do.ipk.kpi.ua/course/view.php?id=4701>
2. Ecological Safety and Civil Protection. Practicum. Educational and methodological complex on Moodle (*platform "Sikorsky"*). Access to registered students. The link to the course <https://do.ipk.kpi.ua/course/view.php?id=5965>

Additional literature

3. A. Nester, O. Nikitin, O. Romanishina, L. Mitiuk, Yu. Polukarov. Achieving environmental security with economic impact. *Naukovyi Visnyk Natsionalnoho Hirnychoho Universytetu, Dnipro*. 2020, (6): pp. 115-120 (Scopus, Q2). <https://doi.org/10.33271/nvngu/2020-6/115>

5. Methods of mastering the discipline (educational component)

Table 2

Names of sections and topics	Number of hours			
	Total	including		
		Lectures	Practical	Self-studying
Topic 1. National security, its directions and components	6	2	2	2
Topic 2. Basic principles and criteria of environmental safety	6	2	2	2
Topic 3. Environmental management as an integral component of a systemic approach to effective enterprise management	1	1		
Topic 4. The specifics of providing first aid depending on the situation	5	1	2	2
Topic 5. State environmental monitoring system of Ukraine	0,5	0,5		
Topic 6. Risk as a quantitative assessment of hazards	1,5	1,5		
Topic 7. Basics of civil protection of the population and territories	2	2		
Topic 8. Emergency situations of a natural nature	2	2		
Topic 9. Emergency situations of man-made nature	18	2	8	8
Topic 10. Emergency situations of a socio-political and military nature	6	2	2	2
Topic 11. Basic principles of rescue and emergency operations	6	2	2	2

<i>Credit</i>	6			6
Total hours	60	18	18	24

Lecture classes

Table

№ з/п	Name of the topic of the lecture	Description of a class
Topic 1. National security, its directions and components		
1	Lecture 1. Ecological safety as one of the components of national security (part 1)	<p>National security. Security levels. Directions for security. Regulatory and legal foundations of state policy in the field of environmental and civil security (Constitution of Ukraine, National Security Strategy of Ukraine until 2030, Civil Defense Code; laws: On national security of Ukraine, On environmental protection, On environmental impact assessment, On protection of atmospheric air, On the main principles (strategy) of the state environmental policy of Ukraine for the period until 2030, On the zone of emergency ecological situation, On the use of nuclear energy and radiation safety, On the management of radioactive waste, On Ukraine's accession to the Vienna Convention on Civil Liability for Nuclear damage, On the protection of people from the effects of ionizing radiation, the order of the Ministry of Emergency Situations of Ukraine On the approval of the Regulation on passporting of potentially dangerous objects; other orders, resolutions).</p> <p>The influence of personality on the speed and quality of decision-making. Tasks at the SS: consider the security culture as an element of the general culture that implements the protective function of humanity; security axioms. Prepare for practical work.</p> <p>Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-1)</p>
Topic 2. Basic principles and criteria of ecological safety		
2	Lecture 2. Ecological safety as one of the components of national security (part 2)	<p>Purpose, principles and tools of state policy in the field of environmental security. Objects and subjects of environmental safety. The current state of environmental problems in Ukraine. Classification of environmental pollution. Main features and criteria of environmental safety. The main factors of accidents and disasters in Ukraine. Water areas, territories and objects are especially vulnerable. The impact of environmental indicators on the health of the global population. Ways to solve environmental problems.</p> <p>The task at the SS: to consider the directions of the manifestations of dangers arising due to the human factor. Prepare for practical work.</p> <p>Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-2)</p>
Topic 3. Environmental management as an integral component of a systemic approach to effective enterprise management		
Topic 4. The specifics of providing first aid depending on the situation		

3	<p>Lecture 3. Measures and means of ensuring ecological and civil safety</p>	<p>Environmental management: concepts and goals. Main aspects of ISO 14001:2015 "Environmental management systems": objectives of the environmental management system, success factors, Plan-Execute-Check-Act Model, scope, expected results and benefits. The importance of providing first aid to preserve the health and life of the victim. Theoretical foundations of first aid. Classification of injuries depending on the type of activity of the victim, according to the degree of severity, depending on the influencing factors, according to the form of manifestation. Resuscitation measures in life-threatening conditions. Typical mistakes when providing first aid.</p> <p>The task at the SS: familiarize yourself with the algorithm for providing first aid for mixed injuries. Prepare for practical work.</p> <p>Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-3)</p>
<p>Topic 5. State environmental monitoring system of Ukraine Topic 6. Risk as a quantitative assessment of hazards</p>		
4	<p>Lecture 4. Environmental monitoring. The concept of risk as a quantitative assessment of hazards</p>	<p>State environmental monitoring system of Ukraine. Subjects of the monitoring system: Ministry of Environmental Protection and Natural Resources, State Emergency Service, Ministry of Agrarian Policy, Ministry of Development of Communities and Territories of Ukraine, State Water Resources Agency of Ukraine, State Agency of Forest Resources of Ukraine, State Service of Ukraine for Geodesy, Cartography and Cadastre, State agency of Ukraine for management of the exclusion zone. State Environmental Inspection of Ukraine: tasks and areas of activity. Concept and classification of risk. Environmental risk. Types of environmental risk. Environmental risk assessment. Assessment of the degree of risk. Stages of environmental risk management. Methods of environmental risk analysis.</p> <p>The task at the SS: get acquainted with the methods of quantitative analysis of environmental risk assessment. Prepare for practical work.</p> <p>Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-4)</p>
<p>Topic 7. Basics of civil protection of the population and territories</p>		

5	<p align="center">Lecture 5. Protection of the population and territories</p>	<p>Legal and organizational foundations and principles of civil protection. Basics of state policy in the field of CG. International cooperation in the field of CG. Unified state system of civil protection (USCSZ). The main tasks and structure of the ECSC. Management bodies of the ECSC and their functions. Civil defense forces. Modes of operation of the Unified State System of Civil Protection. Rights and obligations of citizens of Ukraine in the field of civil protection. Organization and planning of population training, training of management staff and specialists. Basic principles and methods of protecting the population and territories from emergency situations. Alerting and informing in the field of CG. Means of individual and collective protection. Classification of protective structures of the Central Military District. Evacuation measures. Types of evacuation. Organization and conduct of evacuation measures. Disaster medicine. Measures to prevent the negative impact on public health of the consequences of emergency situations. Psychological protection of the population in the event of an emergency. Engineering, radiation and chemical protection of the population and territories.</p> <p>The task at the SS: get acquainted with the general principles of education and training of the population for actions in emergency situations. Familiarize yourself with the norms and standards of life support for victims in emergency zones, on evacuation routes and in places where the evacuated population is located; security measures aimed at preventing the spread of infectious diseases in the emergency zone and the actions of the population that was in the center of infectious diseases.</p> <p>Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-5)</p>
Topic 8. Emergency situations of a natural nature		
6	<p align="center">Lecture 6. Classification of emergency situations</p>	<p>Criteria for the transition of a dangerous event into an emergency situation. Classification of emergency situations. Emergency levels. Classifier of emergency situations of Ukraine. Categories of business objects by the level of threat of emergency occurrence. General characteristics of natural disasters. Natural disasters of a geophysical nature (earthquakes). Natural disasters of a geological nature (volcanic eruptions, landslides, landslides, etc.). Meteorological emergencies (storms, hurricanes, tornadoes, downpours, heavy snowfalls, ice, etc.). Natural disasters of a hydrological nature (floods, floods, rising ground water level, etc.). Disasters are caused by fires in natural ecosystems (forest, steppe and peat fires). Medical and biological emergencies (mass infections and diseases of people, animals and plants - epidemics, epizootics, epiphytotic). Affecting factors and their parameters, the consequences of actions on the environment and people. Ways and methods of protection.</p> <p>The task at the SS: to get acquainted with the complex of organizational and engineering and technical measures for the prevention and minimization of the consequences of natural disasters.</p> <p>Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-6)</p>
Topic 9. Emergency situations of man-made nature		
	<p align="center">Lecture 7. Classification of emergency situations</p>	<p>Industrial accidents, disasters and their consequences. Causes of occurrence. Categories of accidents. Damages of direct and indirect action. Emergencies as a result of accidents or catastrophes on transport. Railway, sea, air, road transport. Basic safety rules. Man-made explosions, their factors, impact on people and the environment. Man-</p>

7		<p>made emergencies in the event of an accident at explosive and fire-hazardous objects. Characteristics of damage centers (OCs) during explosions and fires. Classification of explosive and fire-hazardous zones. Characteristics of degrees of destruction. Determination of categories of buildings according to explosion and fire hazard, degree of their fire resistance. Protection of the population. Accidents with release of dangerous chemicals. Classification of hazardous chemicals by degree of toxicity, flammability. Characteristics of zones of chemical and biological contamination. Determination of the parameters of the zone of contamination by dangerous chemical substances. Emergency due to the presence of harmful substances in the environment above the MPC. Standardization of various types of MPCs of harmful substances, maximum permissible emissions, maximum permissible environmental loads, approximately safe levels of exposure to pollutants in various environments. Radiation disasters: events, facts, figures. Classification of radiation accidents by nature of action and scale. Characteristics of radioactive contamination zones. Determination of the parameters of the zone of contamination with radioactive substances (RR). Forecasting the possible situation at the OGD. Protection of the population and territories from the effects of radiation. Modes of protection of the civilian population. Hydrodynamic accidents. Zones of catastrophic flooding. Preventive measures. Measures to prevent and minimize the consequences of hydrodynamic accidents. Algorithm of actions at the threat of hydrodynamic danger, sudden flooding.</p> <p>The task at the SS: get acquainted with the method of identification and passporting of economic objects and determination of their potential danger. Security passport. Safety declaration. Analysis of dangers associated with violation of the conditions of safe operation of OGD. Familiarize yourself with the peculiarities of planning the actions of OGD personnel in emergency situations. Prepare for practical work.</p> <p>Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-7)</p>
Topic 10. Emergency situations of a socio-political and military nature		
8	<p>Lecture 8. Classification of emergency situations</p>	<p>Socio-political conflicts with the use of conventional weapons and means of mass destruction. Classification of conflicts. Terrorism, its types and affecting factors. Principles of combating terrorism. Terrorist act. Actions when suspicious and explosive devices are detected in a crowded place. Action algorithm if you are taken hostage by criminals and your life and health are in danger. Emergency situations of a military nature. Protection of the population from the dangers of war. International Committee of the Red Cross. Geneva Conventions. A special period. Martial law. Military command and military administrations. Measures to increase defense capability, to exercise political control. Rights and obligations of the population during the introduction of martial law and a state of emergency. Measures in the field of Central Intelligence. State of war. Actions of the civilian population in the combat zone (in the event of a threat of damage by small arms and artillery weapons). Actions of the population during the announcement of an air alert. Algorithm of actions during the threat of house collapse. Actions of the population during the use of chemical weapons and phosphorous ammunition. Basic provisions of the Law of Ukraine "On the Legal Regime of Martial Law". Instructions on how not to become the enemy's assistant and adjuster of his fire. Recommendations for filling the "anxiety suitcase".</p>

		The task at the SS: familiarize yourself with the classification of objects subject to protection from terrorist acts. Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-8)
Topic 11. Basic principles of rescue and emergency operations		
9	Lecture 9. Localization and elimination of emergency situations	<p>Basic principles and methods of protecting the population and territories. Eliminating the consequences of emergencies, based on the forecast of options for the development of events. Reduction of risks, mitigation of consequences and assessment of damages from man-made and natural disasters. Localization and elimination of accidents. Conditions, sequence and methods of performing rescue and other emergency operations. Safety measures during rescue operations. Rescue work in the center of chemical damage. Elimination of the source of infectious diseases. Disinfection of territories, buildings, equipment and sanitary treatment of people. Methods of decontamination, degassing and disinfection at the object of economic activity. Extinguishing forest fires. The use of personal protective equipment, sheltering people in protective structures (ZS), implementation of evacuation measures. Assessment of the reliability of the protection of workers and employees of the object of economic activity using protective structures. Localization and elimination of accidents.</p> <p>The task at the SS: familiarize yourself with radiation and chemical protection of the population. Literature: 1 (https://do.ipk.kpi.ua/course/view.php?id=4701#section-9)</p>

Practical classes

The purpose of practical classes is to deepen knowledge on individual topics of the lecture material and questions that are studied independently; formation of knowledge and skills: identification and analysis of dangerous and harmful factors, development of risk strategies in order to reduce the probability of risk realization and minimize possible negative consequences, providing first aid, responding to emergency situations and carrying out evacuation measures.

Table 4

№ з/п	Description of a class
1	<p style="text-align: center;">Practical work № 1 «The influence of personality on the speed of decision-making» (Topic 1.)</p> <p>The purpose of the work is to acquire theoretical knowledge of general ideas about mental processes and personality properties, methods used for their assessment; acquire practical knowledge of determining one's temperament type based on the main properties of neuropsychological processes, predict the level of work capacity and the speed of decision-making that affect safety.</p> <p>The task at the SS: work out theoretical propositions, complete an individual task and formulate conclusions. Literature: 2 (https://do.ipk.kpi.ua/mod/assign/view.php?id=131614)</p>

2	<p align="center">Practical work №2 «Impact of impressive, dangerous and harmful factors on human health and environmental safety» (Topic 2.)</p> <p>The purpose of the work is to reveal the impact of one of the impressive, dangerous or harmful factors on human health and/or the environment in an abstract-presentational form.</p> <p>The task at the SS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</p> <p>Literature: 2 (https://do.ipk.kpi.ua/mod/assign/view.php?id=131615)</p>
3	<p align="center">Practical work №3 «General principles of providing first aid» (Topic 4.)</p> <p>The purpose of the work is to classify a complex injury (by degree of severity, depending on the influencing factors, by the form of manifestation) and to develop an algorithm for providing first aid to the victim; learn practical methods of providing first aid to victims.</p> <p>The task at the SS: work out theoretical propositions, complete an individual task and formulate conclusions.</p> <p>Literature: 2 (https://do.ipk.kpi.ua/mod/assign/view.php?id=131616)</p>
4	<p align="center">Practical work №4 «Ensuring fire safety at the enterprise, institution, organization» (Topic 9.)</p> <p>The purpose of the work is to master the method of determining the category and class of the zone of the premises according to the explosion and fire hazard, to get acquainted with fire prevention measures and primary means of fire extinguishing.</p> <p>The task at the SS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</p> <p>Literature: 2 (https://do.ipk.kpi.ua/mod/assign/view.php?id=131617)</p>
5	<p align="center">Practical work №5 «Algorithm of actions in case of occurrence or threat of explosions» (Topic 9.)</p> <p>The purpose of the work is to provide practical knowledge on solving typical problems of forecasting the situation that may occur as a result of an explosion; determine the measures aimed at preventing or reducing the damage and injury to people.</p> <p>The task at the SS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</p> <p>Literature: 2 (https://do.ipk.kpi.ua/mod/assign/view.php?id=131619)</p>
6	<p align="center">Practical work №6 «Algorithm of actions during a chemical accident at a facility or transport» (Topic 9.)</p> <p>The purpose of the work is to provide theoretical knowledge on forecasting actions and assessing the situation during a chemical accident at a facility or transport; master the methodology of performing calculations based on initial data and assessing the chemical situation in the area of chemical pollution, formulate conclusions in which to propose an algorithm of actions and measures to protect and minimize the consequences of a chemical accident at a facility or transport.</p> <p>The task at the SS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</p> <p>Literature: 2 (https://do.ipk.kpi.ua/mod/assign/view.php?id=131620)</p>
7	<p align="center">Practical work №7 «Algorithm of actions in case of radiation contamination of the environment» (Topic 9.)</p> <p>The purpose of the work is to provide theoretical knowledge on forecasting actions in conditions of radiation pollution; master the methodology of performing calculations based on initial data and assessing the radiation situation in radiation pollution zones; propose measures for protection and an algorithm of actions in case of radiation pollution.</p> <p>The task at the SS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</p> <p>Literature: 2 (https://do.ipk.kpi.ua/mod/assign/view.php?id=131621)</p>

8	<p style="text-align: center;">Practical work №8 «Evacuation in case of danger. Crowd». (Topic 10.)</p> <p>The purpose of the work is to get a general idea of the crowd as a social danger, to learn the rules of behavior in the crowd, to get acquainted with the construction of an evacuation plan, to learn how to calculate an analytical model of the movement of the flow of people during evacuation. in the event of a dangerous situation in a multi-story public building.</p> <p>The task at the SS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</p> <p>Literature: 2 (https://do.ipk.kpi.ua/mod/quiz/view.php?id=131622)</p>
9	<p style="text-align: center;">Practical work №9 «Evaluation of the reliability of the protection of workers using protective structures» (Topic 11.)</p> <p>The purpose of the work is to provide practical knowledge on determining the most reliable way to protect people in emergency situations by sheltering them in specialized engineering structures: storage facilities and emergency shelters.</p> <p>The task at the SS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</p> <p>Literature: 2 (https://do.ipk.kpi.ua/mod/assign/view.php?id=131623)</p>
10	CREDIT

6. Independent student work

Self-study work (see table 2) involves deepening knowledge on individual topics of the lecture material and preparation for practical work and assessment.

7. Course policy (educational component)

Violation of deadlines and incentive points

The key measures in teaching the discipline are those that form the student's semester rating. Therefore, students must timely complete and pass practical work, as well as pass testing (express survey) after studying the discipline. Penalty points for discipline are not provided.

Incentive points can be awarded for performing creative works from the credit module (work in scientific circles with the preparation of materials for reports or articles for publication, participation in scientific and scientific-practical conferences and seminars, Olympiads in the discipline, development of competitive works, presentations, writing essays and reviews scientific works, analysis of modern methods of information security, etc.). For this, the student is additionally awarded 3-10 rating points, depending on the specific results obtained. The total number of incentive points awarded to a student cannot exceed 10 points.

Attending classes

Attending classes is regulated according to the rules of study at National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". Points for attending lectures are not added. However, for active participation during lectures and practical classes, a student can additionally receive 1-2 points. It should be noted that a significant part of the student's rating is the result of active work in practical classes, which consists in solving assigned tasks, participating in business games, analyzing specific situations, group and individual work. Because of this, skipping a practical session deprives the student of the opportunity to get the maximum score in the semester rating.

Missed control measures

If the control measures are missed for valid reasons (illness or serious life circumstances), the student is given the opportunity to additionally complete the control task during the next week. In case of violation of deadlines and failure to complete assignments due to illegitimate reasons, a student who did not score 30 points during the semester is not allowed to pass the test in the main session.

Calendar border control

Intermediate attestation of students is a calendar boundary control. The purpose of the attestation is to improve the quality of students' education and monitor the students' implementation of the schedule of the educational process.

Table 6

Criterion		First attestation	Second attestation
Term of attestation		8th week	14th week
Attestation conditions	Current rating	$\geq 50\%$ of the maximum possible number of points	

Academic integrity

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

Norms of ethical behavior

Standards of ethical behavior of students and teachers are defined in Chapter 2 of the Code of Honor of the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute". More details: <https://kpi.ua/code>.

The procedure for contesting the results of control measures

Students have the opportunity to raise any question regarding the control measures procedure and wait for their consideration according to predetermined procedures.

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

Current control: practical works, thematic surveys, express surveys, tests. Calendar control: carried out twice a semester, as a monitoring of the current state of fulfillment of the syllabus requirements. Semester control: credit. Conditions for admission to semester control: semester rating of at least 30 points.

A rating system for evaluating learning outcomes (RSE)

Semester assessment of the credit module (CM) is carried out after the end of its study, before the beginning of the examination session. The credit is accepted by the lecturer at the last scheduled class in the study group.

As a rule, credit is issued based on the results of the student's work in the semester, if he received at least 60 points for the RSE. If the student did not receive the required number of points during the semester, credit is given based on the results of the final survey, and in the case of distance learning – additional credit testing (if the conditions for admission to the credit are met – at least 30 points per semester). The maximum number of points that a student can receive for a credit survey (test) cannot exceed 30 points. Students who scored less than 30 points during the semester are not allowed to take the credit survey (testing) during the main session.

During the calendar attestation of students (on the 8th and 14th weeks of the semester) with the CM, the student receives "attested" if, based on the results of planned practical work, the student has a current rating of at least 50% of the maximum possible number of points, otherwise - "not attested".

The student's rating (R) from the credit module consists of the points he receives for:

- 1) performance of practical work (Rp);

2) modular control work in the form of 2 test surveys to determine the results of assimilation of the theoretical component of the course (with distance learning mode) or for answers to 2 express surveys during lectures (R₀);

Total rating score:

$$R = R_p + R_0$$

Maximum value **R=100**

1. Performance of practical works **R_p**

$$R_p = r_p \times n_p + r_9$$

where: r_p – the number of points for one practical session, $\max(r_p)=10$; n_p – number of practical classes; r_9 – introductory practical work (credited/not credited). Points are not awarded for this work.

Thus, the maximum number of points that a student can score for performing practical work:

$$R_p = r_p \times n_p + r_9 = 10 \times 8 + 0 = 80$$

Points for one practical work r_p are determined by the results of personal performance of the task, or the corresponding test task, or survey and individual defense of the work.

Evaluation criteria:

10 points – all tasks and calculations are performed flawlessly, all questions are worked out and fully disclosed, clear, correct conclusions are made and the work is protected (if necessary);

9-8 points – all tasks are generally worked out with minor flaws, single arithmetic errors are possible in the calculations that did not affect the final result, the conclusions are clear and correct, the work is protected (if necessary);

7-6 points – the task as a whole was worked out with one (two) of the following shortcomings: some sections of the task were not completed in full; possible errors or inaccuracies in the calculations; the conclusions are not clear, not comprehensive, the work is protected (if necessary);

5 points - the tasks are not completed, with shortcomings, or with fundamental errors, which indicates a superficial mastery of the material necessary for solving practical problems; the conclusions are fragmentary or somewhat incorrect; as well as for impeccably performed, but untimely and unprotected work submitted without valid reasons;

4-0 points – the tasks were not worked out, or were performed with significant shortcomings and fundamental errors that significantly affected the result obtained, conclusions were not made or they were generally incorrect, which indicates a poor mastery of the material necessary for solving practical problems; the student did not defend (if necessary) the results of the submitted work, performed with deficiencies.

2. Modular control tests.

Modular control tests to determine the results of assimilation of the theoretical component of the course is conducted on the eve of the 1st and 2nd calendar control using the distance learning platform "Sikorsky" (Moodle) in order to diagnose the assimilation of the theoretical material of the discipline. The first test survey involves 8 questions, for each completely correct answer* the student scores 1 point. Thus, the maximum amount of points for 1 test survey is 8 points. The second test survey involves 12 questions, so the maximum score for the 2 test surveys is 12 points. Therefore, the total maximum score for both surveys is 20 points.

*Some test questions require several correct answer options (which is indicated in the task). In this case, the "completely correct answer" is considered to be the choice of all correct answers by the student. A student may receive less than 1 point if he/she does not answer all the correct answers to a question, and 0 points if an incorrect answer is also given among the correct answers.

3. Incentive points (R_i).

Incentive points can be earned for performing creative works from the credit module (preparation of materials for reports or articles for publication, participation in scientific and scientific-practical conferences and seminars, Olympiads in the discipline, development of business games, etc.). For such work, a student can receive 3-10 rating points, depending on the specific results obtained.

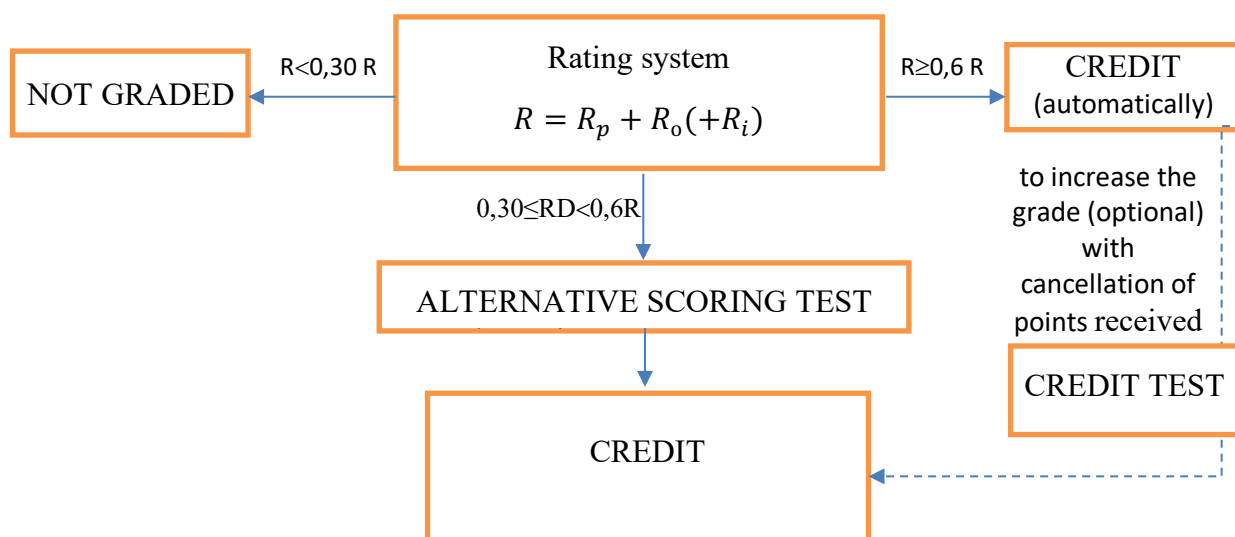
The total number of incentive points awarded to the student should not exceed 10 points.

The sum of the rating points is converted into an assessment according to the table:

Table 7

<i>Points (R)</i>	<i>Grade</i>
95-100	Excellent
85-94	Very good
75-84	Good
65-74	Satisfactory
60-64	Sufficient
Below 60	Fail
Below 30	Not Graded

The scheme of the functioning of the rating system is given below:



According to the results of the Rating system, students receive a CREDIT (automatically) if $R \geq 60$.

If the student received $30 \geq R \leq 60$, credit is given based on the results of the credit survey.

During the survey, students receive, as a rule, three questions or tasks. The list of questions/tasks is given in the appendix to the work program of the credit module. Each question/task is worth 10 points. The number of points received is equal to the number of correct answers.

With the distance form of education, students who have access to credit (30 or more points) instead of an survey are given the opportunity to take a credit test using the Sikorsky distance learning platform (Moodle) with the possibility of obtaining a maximum of 30 points.

Students who have received “automatic” score have the opportunity (exclusively at their own will!) to give up all the scored points and take an alternative SCORING TEST in distance mode using the Sikorsky distance learning platform (Moodle) with a maximum score of 95 points.

9. Additional information on the discipline (educational component)

The list of questions submitted for semester control in Appendix 1.

Designed: PhD, Associate of Professor, Yury Polukarov; Senior lecturer, Olena Zemlyanska

Adopted by Computer Systems Software Department (protocol № 12 from 26.04.23)

Approved by the Faculty Board of Methodology (protocol № 10 from 26.05.23)

Appendix 1. The list of questions submitted for semester control

1. Provide a definition of the concept of "national security", its basic principles and ways of ensuring.
2. Describe the levels of national security.
3. Determine the main directions for ensuring national security.
4. Explain the term "environmental safety".
5. Analyze the environmental threats to the national security of Ukraine.
6. Describe the essence of sustainable development of mankind in terms of environmental safety.
7. Determine the main principles of environmental safety.
8. Describe the current state of environmental problems in Ukraine.
9. Identify major global environmental issues.
10. Provide criteria for environmental safety.
11. Formulate a definition of the concept of "technogenic safety".
12. Determine the legal basis for ensuring the environmental safety of the population.
13. Determine the legal basis for ensuring the environmental safety of the territories.
14. Formulate the general provisions of the Constitution of Ukraine in the field of environmental safety.
15. Analyze the main environmental, socio-ecological and environmental-economic problems of our time. Their interrelation.
16. Analyze the likelihood of new environmental diseases.
17. Provide a general description of the features of modern environmental emergencies.
18. Analyze the presence of vulnerable territories and water areas in Ukraine.
19. Describe the concept of risk as a quantitative assessment of hazards.
20. Explain the essence and give examples of environmental risk.
21. Give the main features by which hazards are classified.
22. Explain what is meant by "acceptable risk"?
23. Explain the essence of risk analysis.
24. Give the main ways in which risk assessment is carried out.
25. Explain what is meant by the concept of "risk management".
26. Explain the essence of risk assessment of environmental hazards.
27. Give the main tasks of control in the field of environmental protection.
28. Define the term "environmental offence".
29. Analyze the main factors of accidents and disasters.
30. Determine the legal framework for civil protection.
31. Analyze and explain the basic principles by which civil protection of the population and territories of Ukraine is carried out.
32. Analyze and explain the general structure of the Unified State System of Civil Defense (USS CD).
33. Determine the main tasks of the Unified State System of Civil Defense (USS CD).
34. Give and describe the modes of operation of the USS CD.
35. Describe the governing bodies, composition, main tasks and rights of civil defense forces.
36. Describe the object and territorial formations of civil defense, their rights and obligations.
37. Formulate the rights and obligations of citizens of Ukraine in the field of civil defense.
38. Describe international cooperation in the field of civil defense.
39. Describe the criteria for the transition of a dangerous situation into an emergency.
40. Give and describe the classification of emergencies according to their causes.
41. Describe the emergency situation at the state level.
42. Describe the emergency at the local level.
43. Describe the emergency situation at the facility level.
44. Explain the structure and purpose of the emergency classifier.
45. Determine the categories of objects according to the level of threat of a man-made, natural and terrorist nature and the degree of their protection.

46. Determine the criteria for the distribution of entities according to the degree of risk of their economic activity.
47. Describe natural emergencies and classify by origin and depending on the scope of their manifestation.
48. Explain the negative impact of damaging factors of a natural nature on the life of people and the functioning of economic facilities.
49. Explain what an earthquake is. Determine the damaging factor of an earthquake and its main parameter. Determine what determines the intensity of the energy of an earthquake on the surface of the earth.
50. Give the rules of behavior of the population during earthquakes.
51. Describe dangerous geological processes and phenomena that can lead to emergencies.
52. Describe the damaging factors of dangerous meteorological phenomena and their negative impact on the life of people and the functioning of economic facilities.
53. Explain the state of the atmosphere "cyclone", "anticyclone" and the order of occurrence of a storm, hurricane, tornado.
54. Present the algorithms of people's actions during a storm, hurricane.
55. Describe ice as a dangerous meteorological phenomenon and give recommendations on the rules of conduct.
56. Describe the types of fog, their impact; provide recommendations on the rules of conduct.
57. Describe mudflows of natural origin. Provide a classification, directions for ensuring safety, and recommendations on the rules of conduct.
58. Give a classification of floods by causes and characterize the consequences of floods and floods.
59. Give the main measures to protect the population in case of catastrophic flooding and recommendations on the rules of conduct.
60. Describe snow avalanches and give recommendations on the rules of conduct.
61. Describe fires in natural ecosystems, their damaging factors, the nature of manifestations and consequences.
62. Name the main signs of a forest fire. Compare the characteristic features of forest and peat fires.
63. Describe the stages of fighting forest fires. Provide advice on rules of conduct.
64. Give and analyze the types of emergency situations of a man-made nature.
65. Describe industrial accidents, disasters and their consequences.
66. Describe emergency situations as a result of accidents or disasters in transport and basic safety rules.
67. Explain the levels of industrial accidents according to their scale.
68. Define and characterize man-made explosions, their factors, impact on people and the environment.
69. Provide definitions of categories of structures for explosion and fire hazard, the degree of their fire resistance.
70. Analyze on what factors the possibility of the outbreak and spread of fire at the facility of economic activity depends.
71. Give an algorithm of actions if an explosion occurred near you.
72. Give a classification of hazardous chemicals according to the degree of toxicity, ability to burn.
73. Explain the procedure for calculating the parameters of the zone of chemical contamination.
74. Give an algorithm of actions to protect the premises from the penetration of toxic aerosols.
75. Provide a classification of radiation accidents according to the nature of the action and scale.
76. Explain what are the levels of intervention in the event of a radiation accident.
77. Analyze the characteristics of the zones of radioactive contamination on the radioactive trace.

78. Describe the ways in which radiation pollution affects a person and explain the mechanism of the effect of ionizing radiation on the human body.
79. Determine the degree of radiation sickness depending on the received doses of radiation. Name the permissible doses of radiation that do not cause radiation sickness.
80. Give regimes for the protection of the civilian population from the effects of radiation.
81. Explain the causes of accidents at hydrodynamic facilities. Describe the areas of catastrophic flooding.
80. Explain the occurrence of a breakthrough wave and its damaging factors.
81. Describe the precautions and actions of the population in case of hydrodynamic danger.
82. Classify and characterize conflicts.
83. Describe terrorism, its types and damaging factors.
84. Give a method of action when an explosive device is found in crowded places.
85. Give a method of action if you are taken hostage by criminals.
86. Describe the principles of combating terrorism.
87. Describe the rights and obligations of citizens during the introduction of martial law.
88. Give algorithms of behavior for the civilian population who find themselves in a combat zone (under the threat of being hit by small arms, air danger).
89. Determine the things that should be in the "alarm backpack".
90. Define the basic principles and explain the ways to protect the population during emergencies, their essence and ways of implementation.
91. Describe personal protective equipment by purpose and principle of operation.
92. Explain the assessment of the classification of protective structures of civil protection according to their properties.
93. Describe shelters of civil protection.
94. Provide a description of the classes and groups of anti-radiation shelters.
95. Explain the life support measures for victims on evacuation routes and places of accommodation of the evacuated population in accordance with established norms and standards.
96. Describe the types of evacuation depending on the characteristics of the emergency. Determine the categories of the population that must be taken out of the city by road during evacuation.
97. Give a method of action for the civilian population when conducting a temporary evacuation from a dangerous area.
98. Describe the radiation and chemical protection of the population and territories.
99. Explain the principles of organizing work to eliminate the consequences of emergency situations.
100. Explain what measures are being taken for the life support of victims of emergencies.
101. Explain security measures aimed at preventing the spread of infectious diseases in the emergency zone. Actions of the population caught in the focus of infectious diseases.
102. Determine the methods of decontamination during the localization and elimination of the consequences of the accident.
103. Determine the ways of carrying out degassing during localization and liquidation of the consequences of the accident.
104. Determine the methods of disinfection during the localization and elimination of the consequences of the accident.
105. Explain what measures are being taken for the life support of victims of emergencies.
106. Explain the algorithm of actions in case of an accident on life support systems.
107. Explain the method of action in case of danger of a collapse of the house.
108. Explain the algorithm for shelling with small arms.
109. Describe the rules of conduct at checkpoints during martial law.
110. Explain the basic rules for not becoming a fire spotter for the enemy.
111. List the main content of the "alarm suitcase".
112. Explain the algorithm of actions during shelling.
113. Explain the algorithm of actions in case of chemical damage.

114. Explain the algorithm of actions in case of a threat of radiation hazard
115. Explain the procedure in case of detection of a suspicious object.
116. Explain the algorithm of actions to detect an explosive device.
117. Provide an algorithm for the actions of different categories of the population during notification of a threat or an emergency situation, special and martial law.
118. Give an algorithm of behavior for the civilian population in the combat zone (under the threat of small arms, air danger).