



# ENVIRONMENTAL SAFETY AND CIVIL PROTECTION

## Program of the academic discipline (Syllabus)

### Details of the academic discipline

Level of higher education	<i>First (undergraduate)</i>
Branch of knowledge	<i>12 Information Technology</i>
Specialty	<i>121 Software Engineering 123 Computer Engineering 126 Information systems and technologies</i>
Educational program	<i>Computer Systems Software Engineering Information systems software engineering Software engineering of intelligent cyber-physical systems and web technologies Software engineering of multimedia and information search systems  Computer systems and networks System programming and specialized computer systems  Integrated information systems Information management systems and technologies Information support of robotic systems</i>
Discipline status	<i>Cycle of general training (normative (mandatory) educational components)</i>
Form of education	<i>daytime</i>
Year of training, semester	<i>1st year, 1st semester</i>
Scope of the discipline	<i>ECTS 2 cr / 60 hours</i>
Semester control/ control tests activities	<i>Assessment/modular control work</i>
Lessons schedule	<a href="http://rozklad.kpi.ua">http://rozklad.kpi.ua</a>
Language of teaching	<i>Ukrainian</i>
Information about the course leader / teachers	Lecturer: candidate of technical sciences, associate professor of the department of labor protection, industrial and civil safety, Prakhovnik Nataliya Arturivna, prakhovnik.nataliia@iil.kpi.ua Practical classes: senior teacher of the department of labor protection, industrial and civil safety, Kachynska Nataliya Fedorivna, kachynska.nataliia@iil.kpi.ua
Placement of the course	<a href="#">Links to distance learning courses in Moodle</a> <a href="https://do.ipk.kpi.ua/course/view.php?id=473">https://do.ipk.kpi.ua/course/view.php?id=473</a>

## Program of educational discipline

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

The educational discipline belongs to the cycle of general training.

**The purpose of the educational discipline** is the formation of students of higher education relevant competencies for professional activities in the specialty with mandatory compliance with safety requirements and occupational health and safety standards, using the latest achievements of scientific and technical progress and international security experience, preservation of life, health and working capacity; formation of students' responsibility for personal and collective safety in everyday conditions and during emergency situations and martial law, taking into account the peculiarities of future professional activity in the primary position.

Thus, the purpose of the educational discipline is to form students' abilities to:

- to exercise one's rights and responsibilities as a member of society, to be aware of the values of civil (free democratic) society and the need for its sustainable development, the rule of law, the rights and freedoms of a person and a citizen in Ukraine;
- preserve and multiply the 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 technologies, use different types and forms of motor activity for active recreation and leading a healthy lifestyle;
- act socially responsibly and consciously.

**The subject of the academic discipline** is the legislative, regulatory, socio-economic, engineering-technical and sanitary-hygienic foundations of life safety, labor protection and civil protection. Particular attention is paid to the sanitary and hygienic requirements for working with computer equipment and the issues of the rights, duties and behavior of the population in the conditions of a special and martial law.

#### Why does a student need it?

Having learned 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 labor protection and civil protection in their professional activities; assess sanitary and hygienic conditions and the level of safety; identify harmful and dangerous factors in the household and social environment; to have the basic methods of preserving life and health, including in emergency situations (ES). After mastering the material of the discipline, students will have knowledge of legislative, regulatory, regulatory, technical, and sanitary-hygienic bases for life safety, labor protection, and civil protection; modern problems and main tasks of security; basics of labor protection and economic components of labor protection; basic provisions of fire safety; the procedure for actions in the conditions of state of emergency and martial law; methods of protection against the influence of dangerous factors caused by emergencies. Students will have higher competitiveness in the labor market, because they will be able to use indicators of a high level of labor safety, provision of services in the field of information technologies. Also, applicants will be able to evaluate impressive factors during an emergency and their impact on human health; choose and use means of collective and personal protection; to provide assistance and advice on practical issues of security and protection in emergency situations; provide first aid; to act when carrying out evacuation measures.

**The study of the discipline will allow the student of higher education to develop the following competencies and program learning outcomes:**

- Ability to learn and master Modern Knowledge (GC5)
- Ability to search, processing and analysis of Information, from different sources (GC6)
- The desire to preserve the Environment (GC9)
- Ability to preserve and increase Moral, Cultural, Scientific values and achievements of society based on understanding 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, Techniques and Technologies, different types and forms of physical activity to rest and lead a Healthy Lifestyle (GC12)
- Ability to assess and take into account Economic, Social and Environmental factors that affect the Field of Professional Activity (PC9)
- Analyze, purposefully search and select the Information and Reference Resources and Knowledge necessary for solving Professional Tasks, taking into account the Modern Achievements of Science and Technology (PLO01)

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

The discipline uses achievements and methods of fundamental and applied sciences and provides pre-diploma practice.

## **3. Content of the academic discipline**

Table 1.

Study week	The subject being studied
	<b>Chapter 1. Life safety as a basic concept of sustainable development</b>
1	Categorical and conceptual apparatus for life safety, taxonomy of hazards (Theme 1.1)
2	Risk as a quantitative assessment of hazards (Theme 1.2)
3	Natural, man-made and socio-political hazards, their types, features and characteristics (Theme 1.3) General principles of providing first aid (Theme 1.4)
	<b>Chapter 2. Labor protection as a guarantee of health and work capacity</b>
4	Legislative, regulatory and socio-economic foundations of labor protection (Theme 2.1.)
5	Analysis of working conditions. Sanitary and hygienic certification of workplaces and units (Theme 2.2.)
6	Basics of industrial safety. Fire safety at the objects of economic activity. (OEA) (Theme 2.3.)
7	Organization and management of labor protection in the organization (Theme 2.4.)
	<b>Section 3. Civil protection of the population and territories</b>
8	Legislative and regulatory foundations of civil protection. Emergency situations of man-made, socio-political and military nature (Themes 3.1, 3.2)
9	Basic principles and methods of protecting the population and territories from emergency situations. Organization and maintenance of the CP at the OAE. (Themes 3.3, 3.4)
10	Final certification (credit)

#### 4. Educational materials and resources

##### Basic literature:

1. Life safety and civil protection : підручник / О. Г. Levchenko, О. V. Zemlyanska, N. A. Prakhovnik, V.V. Zacarnyi. – Kyiv: Karavela, 2019. – 268 p.
2. Life safety and civil protection : textbook appendices / О. Г. Levchenko, О. V. Zemlyanska, N. A. Prakhovnik, V. V. Zacarnyi. – Kyiv: Karavela, 2019. – 312 p.
3. О. V. Zemlyanska, N. A. Prakhovnik, V. V. Zacarnyi, Zacarna O.V. Life Safety: textbook – K.: NTUU «KPI» IEE, 2016. – electronic edition. URL:<http://ela.kpi.ua/kandle/123456789/18263>.
4. Tretyakova L.D., Lytvynenko G.E. Personal protective equipment; manufacturing and application: textbook. – K.: Libra, 2008. – 317 p.
5. Basics of labor protection [electronic edition] : book / K. N. Tkachuk, V. V. Zacarnyi, D. V.Zerkalov, O. I. Polukarov [and oth] ; NTUU «KPI named Igor Sikorsky». – Electronic text data (1 file: 7,4Mbite). – Kyiv : Basis, 2015. – 456 p. – Screen Title. – Access : <http://ela.kpi.ua/handle/123456789/18512>
6. Tkachuk K.N., Molchak Ya.O., Kashtanov S.F., Polukarov O.I. and oth. Management of labor protection: Textbook. – Lutsk: 2012. – 287 p.
7. Tkachuk K.N., Kalda G.S., Kashtanov S.F., Polukarov O.I. and oth. Psychology of work and its safety: Textbook. – Khmelnytskyi 2011. – 135 p.
8. Mikheev Yuriy.B., Prakhovnik N.A., Zemlyanska O.V., Civil Protection: Textbook – K.: Basis, 2014. – electronic edition. URL: <http://ela.kpi.ua/handle/123456789/18966>.
9. Life Safety. Methodical instructions for the performance of practical work for students of all fields of training according to the educational and qualification level "bachelor" of full-time education. Compilers:Zemlyanska O.V., Prakhovnik N.A., Kachynska N.F., Chikunova-Vasiliieva N.P., Luts T.E., K: NTUU «KPI», 2014. 111p. <https://ela.kpi.ua/handle/123456789/18255>

##### Support resources:

10. Constitution of Ukraine. The Basic Law of Ukraine dated 28.06.1996 № 254c/96-VR (current edition 30.09.2016) – [zakon4.rada.gov.ua](http://zakon4.rada.gov.ua).
11. Civil Protection Code of Ukraine dated 02.10.2012 № 5403-VI (current edition – 05.10.2016) – [zakon2.rada.gov.ua](http://zakon2.rada.gov.ua).
12. Code of Labor Laws of Ukraine dated 10.12.1971 № 322-VIII (current edition – 05.10.2016) – [zakon5.rada.gov.ua](http://zakon5.rada.gov.ua).
13. Code of Ukraine on administrative offenses dated 07.12.1984 № 8073-X (current edition –27.07.2016) – [zakon3.rada.gov.ua](http://zakon3.rada.gov.ua).
14. Civil Protection Code of Ukraine dated 02.10.2012 № 5403-VI (current edition – 17.03.2021) – [zakon2.rada.gov.ua](http://zakon2.rada.gov.ua).
15. Fundamentals of Ukrainian legislation on health care: Law of Ukraine dated 19.11.1992 p. № 2801-XII (current edition – 01.01.2016) – [zakon5.rada.gov.ua](http://zakon5.rada.gov.ua).

16. On ensuring sanitary and epidemic well-being of the population: Law of Ukraine dated 24.02.1994 № 4004-XII (current edition – 28.12.2015) – zakon5.rada.gov.ua.
17. On the approval of the State-wide social program for the improvement of safety, occupational hygiene and the industrial environment for 2014-2018: Law of Ukraine dated 04.04.2013 (current edition 01.01.2015) – zakon2.rada.gov.ua.
18. Convention on the Basics of Occupational Safety and Health No. 187: International Document dated 15.06.2006 № 187 – zakon5.rada.gov.ua.
19. On labor protection: Law of Ukraine dated 14.10.1992 № 2694-XII (current edition – 05.04.2015) – zakon5.rada.gov.ua.
20. On the basic principles of state supervision (control) in the field of economic activity: Law of Ukraine dated 05.04.2007 № 877-V (current edition – 01.01.2017) – zakon0.rada.gov.ua.
21. On state market supervision and control of non-food products: Law of Ukraine dated 02.12.2010 № 2735-VI (current edition – 10.02.2016) – zakon2.rada.gov.ua.
22. On mandatory state social insurance: Law of Ukraine dated 23.09.1999 № 1105-XIV current edition – 01.01.2017) – zakon0.rada.gov.ua.
23. DSTU 2272-2006 Fire Security. Terms and definitions of basic concepts.
24. DBN B.2.5-28-2006 Natural and artificial lighting
25. DSTU OHSAS 18001:2010 Occupational health and safety management systems. Requirements Register of normative legal acts on labor protection (НПАОП).
26. Procedure for classifying emergency situations by their levels: Resolution of the Cabinet of Ministers of Ukraine dated 24.03.2004 № 368 (current edition – 29.05.2013) – zakon3.rada.gov.ua.
27. Procedure for classifying emergency situations by their levels: Resolution of the Cabinet of Ministers of Ukraine dated 26.06.2013 № 444 – zakon3.rada.gov.ua.
28. On the approval of the Regulation on the unified state system of civil protection: Resolution of the Cabinet of Ministers of Ukraine dated 09.01.2014 № 11 – zakon5.rada.gov.ua.

Terrorist acts, sabotage, mining: Letter of the Ministry of Education and Science of Ukraine and the State Service of Ukraine for Emergency Situations dated 05.02.2015 p. № 1/9-55/02-1645/12 – document.ua.

## 5. Methods of mastering an educational discipline (educational component)

### The structure of the academic discipline

Table 2.

Names of sections and themes	Number of hours				
	In total	including			
		Lectures	Practical (seminar)	Laboratory (computer and practical)	IWS
1	2	3	4	5	6
<b>Chapter 1 Life safety as a basic concept of sustainable development</b>					
Theme 1.1. Categorical and conceptual apparatus for life safety, taxonomy of hazards.	6	2	2		2
Theme 1.2. Risk as a quantitative assessment of hazards	6	2	2		2
Theme 1.3. Natural, man-made and socio-political hazards, their types, features and characteristics	2	2			
Theme 1.4. General principles of providing first pre-medical help	4		2		2
Together by chapter 1	18	6	6	-	6
<b>Chapter 2 Occupational health and safety as a guarantee of maintaining health and working capacity</b>					
Theme 2.1. Legislative, regulatory and socio-economic foundations of labor protection	2	2			
Theme 2.2. Analysis of working conditions. Parameters of the production environment of premises with visual display terminals of electronic computing machines (VDT ECM) and personal electronic computing machines (PECM)..	10	2	4		4
Theme 2.3 Basics of industrial safety. Fire safety at business facilities.	6	2	2		2
Theme 2.4. Organization and management labor protection in the organization	2	2			
Together by chapter 2	20	8	6		6
<b>Chapter 3. Civil protection of the population and territories</b>					
Tema 3.1. Legislative and regulatory foundations	1	1			

of civil protection Тема 3.2. Emergency situations of man-made, socio-political and military nature Тема 3.3. Localization and liquidation of ES. Basic principles and methods of protecting the population and territories from emergency situations Тема 3.4. Організація і забезпечення CS на ОЕА	1  5  9	1  1  1	  2  4		  2  4
Together by chapter 3	16	4	6		6
Test	6				6
Hours in general	60	18	18	-	24

#### 4. Lecture classes

Table 3.

№ з/п	The name of the topic of the lecture and a list of main questions
1	<p><b>Lecture 1. Categorical and conceptual apparatus for life safety, taxonomy of hazards (<i>Theme 1.1.</i>)</b></p> <p>Model of human activity. Theoretical foundations of life safety. Human safety, society, national security. Methodological foundations of life safety. Taxonomy, identification and quantification of hazards.</p> <p>Hazard classification. Types of hazards. Criteria for the transition of a dangerous event into an emergency (Emergency). The role of psychological stability of a person in ensuring safety.</p>
2	<p><b>Lecture 2. Risk as a quantitative assessment of hazards (<i>Theme 1.2</i>)</b></p> <p>General analysis of risk and security problems of complex systems that include people, objects of the technosphere and the natural environment. Individual and group risk. The concept of acceptable risk. Methodical approaches to risk determination. Peculiarities of assessment and management of professional risks</p>
3	<p><b>Lecture 3. Natural, man-made and. socio-political dangers, their types, features and characteristics (<i>Theme 1.3</i>)</b></p> <p>Hazard classification. Criteria for the transition of a dangerous event into an emergency. The role of psychological stability of a person in ensuring safety.</p> <p>Types of natural hazards that can lead to emergencies.</p> <p>Safety in the "man-machine-environment" system. Types of man-made hazards that can lead to emergencies.</p> <p>Global problems of humanity. Socio-political dangers. The influence of modern information technologies on people and the safety of society. Corruption and criminalization of society. Harmful habits, social diseases and their prevention. Crime as a factor of danger, its types. Prevention and countermeasures at home</p> <p>Violence. The crowd: dangers and rules of conduct.</p>
4.	<p><b>Lecture 4. Analysis of working conditions. Sanitary and hygienic certification of workplaces and units (<i>Theme 2.2.</i>)</b></p>

	<p>General approaches to assessing working conditions and ensuring adequate, safe and healthy working conditions. Industrial sanitation and safety</p> <p>Tasks and content of occupational hygiene and industrial sanitation. Factors determining sanitary and hygienic working conditions. Sanitary and hygienic requirements for production and auxiliary premises, location of production and office equipment, computer equipment and organization of workplaces.</p> <p>Hygienic classification of work. Attestation of workplaces according to working conditions. Map working conditions.</p>
5	<p><b>Fundamentals of industrial safety. Fire safety at objects of economic activity. (OEA) (Theme 2.2.)</b></p> <p>General safety requirements for technological equipment and processes. Requirements for workplaces regarding their safety. Colors, safety signs and signal markings.</p> <p>Electric current as a danger factor. Classification of premises according to the degree of danger of electric shock. Directions for improving the safety of operation of electrical installations.</p> <p>General concepts of the basics of the theory of the origin, development and termination of combustion. Indicators of fire and explosion hazard of substances and materials. Categories of premises according to explosion and fire hazard. Classification of explosions fire hazard zones. The main areas of ensuring fire safety of business facilities. Personnel actions in the event of a fire</p>
6.	<p><b>Lecture 6. Legislative, regulatory and socio-economic foundations of labor protection (Theme 2.1.)</b></p> <p>Occupational health and safety as a component of life safety. Structure of labor protection.</p> <p>Legislation of Ukraine on labor protection. The system of state management and supervision of labor protection. Normative and legal acts on labor protection (НПАОП), standards and other national documents on labor protection. Conventions and Recommendations of the International Labor Organization (ILO) in the field of labor protection. The legislative base of the European Union on labor protection issues. Labor protection is part of the social policy of the EU. EU directives on occupational health and safety.</p> <p>Labor protection as an integral component of social responsibility. Definition and main principles of social responsibility. Social insurance against accidents and occupational diseases at work.</p>
7	<p><b>Lecture 7. Organization and management of labor protection in the organization (Theme 2.4.)</b></p> <p>The structure, main functions and tasks of labor protection management in the organization. Basic requirements for the construction and functioning of the labor protection management system (MSLP) Labor protection service of the enterprise. International standard OHSAS 18001:2010.</p> <p>Principles of organization and types of training on labor protection issues. Briefings on labor protection issues. Internship (duplication) and admission of employees to independent work. Investigation and accounting of accidents at enterprises</p> <p>Interrelationship of labor protection and financial and economic indicators of the enterprise. Financing of labor protection. Evaluation of the effectiveness of labor protection costs. Occupational health and safety as a loss management tool.</p>
8	<p><b>Lecture 8. Legislative and regulatory foundations of civil protection Emergency situations of man-made, socio-political and military nature</b></p>



	<p><b>(Theme 3.1, 3.2)</b></p> <p>Legislative and regulatory foundations of civil protection. Classification of emergencies by causes of origin. State Service of Ukraine for Emergency Situations (State Emergency Service of Ukraine).</p> <p>Emergency types of man-made nature. Causes of occurrence. Impressive factors, negative impact and consequences. Prevention and minimization of the consequences of man-made natural disasters.</p> <p>Socio-political conflicts with the use of conventional weapons and means of mass destruction. Terrorism, its types and influencing factors. Actions when suspicious and explosive devices are detected in a crowded place.</p> <p>Emergency situations of a military nature. Rights and responsibilities of the population during the introduction of martial law and a state of emergency. War. Actions of the civilian population in the war zone.</p>
9	<p><b>Lecture 9. Basic principles and methods of protecting the population and territories from emergency situations. Organization and maintenance of civil safety at the object of economic activity . (Theme 3.3, 3.4)</b></p> <p>Alerting and informing in the field of civil safety. Means of individual and collective protection. Evacuation measures. Medical and psychological rehabilitation of injured persons. Localization and liquidation of emergencies.</p> <p>Civil safety at the object of economic activity (OAE). Structure. Activities Functions and responsibilities of the head of the OAE and the procedure for personnel actions in the event of an emergency.</p>

## 5. 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 skills and acquisition of experience: assessment of dangerous and harmful factors, impacting factors and their impact on human health, development of risk strategies with the aim of reducing the probability of risk realization and minimizing possible negative consequences, providing first aid, carrying out evacuation measures.

Table 4.

№ 3/п	Name of the subject of the lesson and list of main questions (list of didactic support, references to literature)
1	<p><b>Practical work No. 1 "Ergonomic evaluation of the workplace»</b></p> <p>The purpose of the work is to get acquainted with the principles and methods of ergonomic evaluation of the workplace</p> <p><i>independent work of student(IWS): to work out theoretical propositions, complete an individual task and formulate conclusions.</i></p> <p><i>literature:8.1.4,</i></p>
2	<p><b>Practical work No. 2 "The concept of hazard risk. Quantitative assessment of individual hazard risk».</b></p> <p>The purpose of the work is to acquire basic knowledge of hazard risk assessment, understanding and the ability to translate the quantitative assessment of risk into its qualitative characteristics, mastering the methodology and algorithm for calculating the risk of encountering a danger to oneself during the year (task No. 1), and also for another person (task No. 2), based on the relevant conditions.</p> <p><i>independent work of student(IWS): to work out theoretical propositions, perform tasks according to the variant and formulate conclusions.</i></p>

	<i>literature: 8.1.10, c. 33-38; 8.1.2. c.103-107.</i>
3	<p><b>Practical work No. 3 "General principles of providing first aid to victims»</b></p> <p>The purpose of the work is to learn practical methods of providing first aid to victims who have received one of the most common injuries or an acute illness. The work consists in solving practical tasks, each of which describes the situation of a person receiving an injury. It is necessary to classify the injury (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) and develop a strategy for providing first aid to the victim in this situation.</p> <p><i>independent work of student(IWS): to work out theoretical propositions, perform tasks according to the variant and formulate conclusions.</i></p> <p><i>literature: 8.1.2, c. 54-65; 8.1.2, c. 117-163.</i></p>
4	<p><b>Practical work No. 4 "Microclimatic conditions of the working space and ways of their normalization.»</b></p> <p>The purpose of the work is to get acquainted with the main air parameters of the working area in the work premises, to acquire practical skills in their assessment from the point of view of occupational safety, to familiarize with regulatory documents and the main measures aimed at improving the air environment.</p> <p><i>IWS: to work out theoretical propositions, perform tasks according to the variant and formulate conclusions.</i></p> <p><i>literature: 8.1.1, c. 93–95.</i></p>
5	<p><b>Practical work No. 5 "Organization of natural and artificial lighting at workplaces and its impact on those able to work»</b></p> <p>The purpose of the work is to get acquainted with the principles of assessment and methods of ensuring workplace lighting</p> <p><i>IWS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions..</i></p> <p><i>literature: 8.1.1, c. 91-93; 8.1.2, c. 197–204</i></p>
6	<p><b>Practical work No. 6 "Influence and consequences of noise, ultrasound and infrasound on the human body and hygiene standards»</b></p> <p>The purpose of the work is to study the effect on the human body of noise, ultrasonic and infrasound vibrations that occur in industrial premises, the normalization of the parameters of these factors; familiarize yourself with the main measures aimed at protecting workers from the negative effects of noise, ultra- and infrasound.</p> <p><i>literature:</i></p> <p><i>IWS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</i></p>
7	<p><b>Practical work No. 7 "Crowd: dangers, rules of conduct and evacuation routes"</b></p> <p>The purpose of the work is to learn the rules of behavior in a crowd, to get acquainted with the construction of an evacuation plan and the ability to use it, to acquire the skills of calculating evacuation routes in the event of a fire in a multi-story public building.</p> <p><i>literature: 9.1.1, c. , 9.2.25,c.23-49</i></p> <p><i>IWS: work out the theoretical provisions, complete the task according to the option and formulate conclusions.</i></p>
8	<p><b>Practical work No. 8 "Civil protection during explosions and fires»</b></p> <p>The purpose of the work is to provide students with practical knowledge on solving typical problems of forecasting the situation that may occur at an industrial facility as a result of an explosion; determine the measures aimed at preventing or reducing the damage and injury to people.</p>

	<i>literature: 9.1.12, c. 165-180, 9.1.14, 9.1.10, c. 6-19</i> <i>IWS: work out the theoretical provisions, complete the task according to the option and to formulate conclusions highlighting the main activities of civil safety.</i>
9	<b>Practical work No. 9 "Features of the influence of radiation on the human body. Basic measures of civil protection in the event of dangerous situations.»</b> The purpose of the work: to consolidate theoretical knowledge and gain practical skills in assessing the radiation situation in areas of radioactive contamination in the event of an accident at a radiation-hazardous facility.. <i>literature: 9.1.12, c. 136-164, 9.1.14, 9.1.10, c. 37-68</i> <i>IWS: to work out the theoretical propositions, complete the task according to the option and formulate conclusions.</i> <b>TEST</b>

Mastering the academic discipline will allow the realization of program learning outcomes as follows:

Program learning outcomes OH	Teaching methods	Assessment forms
PC2. Know the code of professional ethics, understand the social significance and cultural aspects of software engineering and adhere to them in a professional activity.	The discipline includes lectures, practical classes, and independent work of students. This determines the use of explanatory and illustrative, research, reproducible and practical methods.	Rating system of evaluation, which includes: evaluation of the performance of practical works, test control works, credit

## 6. Self-study

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

## 7. Course Policy

### 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 complete and submit practical work in a timely manner and take a test (express survey) after completing each section. Penalty points for discipline are not provided. Incentive points can be awarded for performing creative works (work in scientific circles with the preparation of report materials or articles for publication, participation in scientific and scientific-practical conferences and seminars, olympiads in the discipline, contests of works, essays and reviews of scientific works, analysis of the modern legal framework on labor protection in the country and its compliance with the requirements of international standards, etc.) - 3-10 rating points are additionally awarded points depending on the specific results obtained.

The total number of incentive points awarded to a student cannot exceed 10 points

### Attending classes

Attending lectures is free, no points are added for attending lectures. However, a significant part of the student's rating is formed through active participation in practical activities, and specifically in problem solving, participation in business games, analysis of specific situations, group and individual work. Therefore, skipping a practical lesson does not give the student the opportunity to receive a share of points 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 45 points during the semester is not allowed to pass the test in the main session.

### Calendar border control

Intermediate certification of students (hereinafter - certification) is a calendar boundary control. The purpose of the certification is to improve the quality of students' education and monitor the students' implementation of the schedule of the educational process.

Criterion		First attestation	Second attestation
Conditions receiving attestation	Current rating	≥ 50% of maximum possible amount of score	According to schedule on 8 <sup>th</sup> and 14 <sup>th</sup> weeks of the semester

### 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 "Ihor 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 "Ihor Sikorskyi 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 issue relating to the screening process and expect it to be dealt with in accordance with pre-defined procedures.

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

**Current control:** practical work, express survey, survey on the subject of the lesson, tests.

**Calendar control:** conducted 2 times a semester (according to the schedule) as a monitoring of the current status of meeting the requirements of the syllabus.

**Semester control:** assessment

**Conditions for admission to semester control:** semester rating of more than 40 points.

### **A rating system for evaluating learning outcomes**

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 (issued) by a scientific and pedagogical worker, to whom he lectured during the last practical session 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 RS. If the student did not receive the required number of points during the semester, the credit is set according to the results of the final interview, and in the case of distance learning - taking into account 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 interview (test) cannot exceed 10 points. Students who did not score 30 points for the semester before the credit interview (testing) during the main session are not admitted.

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

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

- 1) performance of practical work  $R_p$ ;
- 2) a test survey for mastering the course (answers to an express survey during a lecture or practical work) as needed by  $R_o$ ;
- 3) RS provides for the possibility of additional use of penalty ( $R_{sh}$ ) and incentive ( $R_h$ ) points.

The maximum value of  **$RD=100$**

**Performance of practical work  $R_p$**  has a weighted point

where: – number of practical classes;

– number of points for practical work (individual task);

- the number of surveys;

- the number of points for the survey (control work) on the topics of practical works.

The maximum value of  **$R_p = 90$** .

Evaluation criteria:

- performance of an individual task of practical work:

9-10 points - the calculations were performed flawlessly, all questions were worked out and fully disclosed, clear and correct conclusions were made, the answers to the questions were complete, comprehensive, justified,

the student is well versed in theoretical and practical material;

7-8 points - all the tasks were worked out in general with minor shortcomings that did not affect the final result, minor arithmetical errors are possible in the calculations; the answers to the questions are correct, but with some inaccuracies or are not completely complete;

6 points - tasks are generally worked out, but some are incomplete, significant errors or inaccuracies are possible in calculations, conclusions are not clear, answers to questions are not comprehensive, incomplete or inaccurate, the student has fragmentary information;

5-0 points - tasks are not worked out or performed with significant shortcomings and fundamental errors, the student does not have the material necessary to solve practical problems, conclusions are not made or they are incorrect.

### 3. Express survey (Ro)

The survey is one test task with 10 questions for three meaningful blocks of the discipline, which is conducted during a lecture or during practical work. In the case of distance learning, the express survey can take place in the form of a test on the distance learning platform "Sikorsky" (Moodle).

Evaluation system of express control works:

- the number of points received is equal to the number of correct answers.

Thus, the maximum number of points for the survey is 10.

At the student's request, instead of an express survey, he can submit a report thesis (article), for which he can receive a maximum of 10 points.

Evaluation criteria for theses (articles) (Rt):

10 points – the work was performed at a high scientific level; the uniqueness of the text is at least 70%; the content of the text fully corresponds to the title of the work; meaningful ones are clearly highlighted in the work elements; the bibliographic description of literary sources is made according to modern requirements; conclusion clearly reflects the author's scientific contribution;

8 points - the work was performed at a fairly high scientific level; the uniqueness of the text is at least 60%; the content of the text corresponds to the title of the work, but there are certain inaccuracies in the wording; almost all meaningful elements are clearly highlighted in the work; the bibliographic description of literary sources is made according to modern requirements; the conclusion as a whole reflects the author's scientific contribution but is somewhat "blurred";

6 points - the work is done at an average level; the uniqueness of the text is at least 50%; the content of the text corresponds to the title of the work, but there are certain inaccuracies in the wording; content elements are not highlighted in the work; the bibliographic description of literary sources is performed according to the requirements of outdated standards; the conclusion is comprehensive, but does not reflect the author's scientific contribution;

4 points - the work was performed at a not too high scientific level; the uniqueness of the text is at least 40%; the content of the text does not fully correspond to the title of the work, there are certain inaccuracies in the wording; there is no argumentation of the relevance of research; content elements are not clearly highlighted in the work; the bibliographic description of literary sources is performed according to the requirements of outdated standards; the conclusion does not reflect the author's scientific contribution;

2 points - the work was performed at a low (referential) level; text uniqueness is less than 30%; the content of the text does not correspond to the title of the work, there are many inaccuracies in the wording; there is no argumentation of the relevance of research; there is no decoding of abbreviated names of terms; content elements are not highlighted in the work; the bibliographic description of literary sources is performed according to the requirements of outdated standards; there is no conclusion.

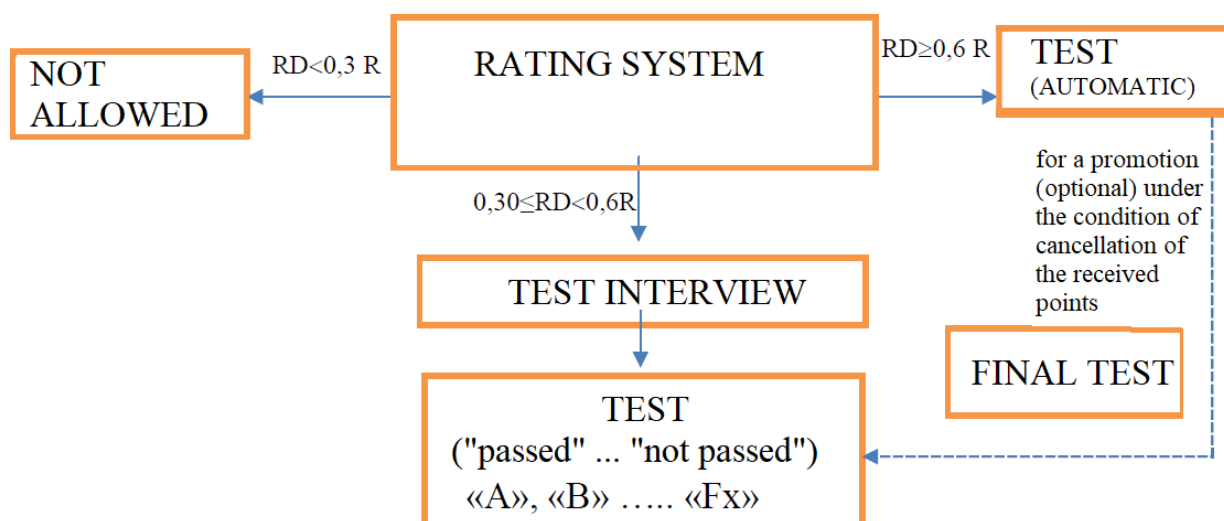
0 points - the work was performed at a very low (referential) level; the uniqueness of the text is less than 20%; the content of the text does not correspond to the title of the work, there are many inaccuracies in the wording; there is no argumentation of the relevance of research; there is no decoding of abbreviated names of terms; content elements are not highlighted in the work; there is no bibliographical description of literary sources; there is no conclusion.

**Use of incentive points ( Ri).** incentive points can be awarded for: provided excellent preparation and active work during the lecture/practical class, 1 point can be added as an incentive;

- performance of 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, contests of works, essays and reviews of scientific works, analysis of modern regulatory and legal base on labor protection in the country and its compliance with the requirements of international standards, etc.) - 3-10 rating points are additionally awarded depending on the specific results obtained. The actually received sum of rating points (RD) taking into account the incentive points ( $RD = R_n + R_o + P_3$ ) is converted into a rating according to the table:

<b><i>R points</i></b>	<b><i>Final assessment</i></b>
95-100	Perfectly
85-94	Very good
75-84	Good
65-74	Satisfactorily
60-64	Enough
Below 60	Unsatisfactorily
Practical part is not rated(i) $RD < 30$	Not allowed

Below is the scheme of operation of RS



According to the results of the RS, students receive a GRADING (automatic) if  $RD \geq 60$ .  
If the student received  $30 \leq RD \leq 60$  for RS, credit is given based on the results of the credit interview.

At the interview, 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. Questions/tasks are valued at 30 points.

In the case of distance education, students who have admission to credit (30 or more points) may be given the opportunity to take a distance credit test using the Sikorsky distance learning platform (Moodle) along with the interview, with the possibility of obtaining a maximum of 30 points.

Students who have received an automatic score have the opportunity (exclusively at their own request!), to give up all the scored points and take an alternative SCORE TEST with a maximum score of 95 points using a video conference (ZOOM or others)\*

\*by the teacher's decision, distance learning can be done using the Sikorsky distance learning platform (Moodle).

## **9. Additional information on the discipline (educational component)**

### **The list of questions submitted for semester control**

#### **Chapter 1. Life safety is the key to sustainable development**

1. To analyze the interrelationship of individual components of the vital activity system and their importance for the comprehensive solution of human safety problems

2. List and characterize the classification of hazards and the principles of their identification

3. Risk - as a quantitative assessment of dangers

4. To describe methodical approaches to risk determination

5. Explain the essence of the concept of acceptable risk and risk management.

6. Provide a brief description of methods and tools for managing the identified risk.

7. List the main types and characteristics of modern socio-political dangers

8. Types of terrorism, its primary, secondary and cascading impact factors.

9. Action algorithm when suspicious and explosive devices are detected in a crowded place

10. Describe the impact of modern information technologies on human health and safety

society

11. Corruption and criminalization as threats to the sustainable development of society

12. Harmful habits, social diseases and their prevention.

13. Concepts and types of crowd. Behavior of a person in a crowd.

#### **Chapter 2. Labor protection**

14. To analyze the place and features of labor protection in the safety system human activities

15. Define and characterize the purpose, structure, subjects and objects of OP.

16. List and characterize the main sources of negative impact on the state of the human body under work time

17. Analyze the factors of the labor process and working environment from the point of view of labor protection

18. Determine and analyze the factors that determine sanitary and hygienic working conditions.

19. State and characterize the hygienic parameters of the air in the working area and the principles of their evaluation.

20. Describe the effectiveness and scope of use of the main methods of normalization air parameters of the working area.

21. Describe the principles and methods of evaluating industrial lighting

22. Analyze the options for providing workplace lighting. Features selection and operation of lighting systems



23. Justify the requirements for workplace lighting.
24. Explain the features of the impact and assessment of the effects of noise on humans.
25. Analyze methods of collective and individual protection against noise.
26. Explain the peculiarities of the impact and assessment of the consequences of optical radiation on humans range
27. Describe sources, methods of collective and individual protection against radiation of the optical range.
28. Analyze the essence and practical significance of the hygienic classification of work
29. Describe the effect of electric current on the human body and its possible consequences.
30. Analyze the factors affecting the danger of electric shock to a person current
31. To analyze the probable conditions of injury to a person by electric current. Give examples.
32. Give a general description of the methods of ensuring safe operation electrical appliances and principles of their selection.
33. Determine the conditions for the occurrence and flow of the combustion process and analyze their impact on the system fire prevention.
34. To analyze the practical significance of the classification of premises and buildings from the explosion fire department danger
35. To analyze the practical significance of the classification of fire and explosive zones
36. Describe the role and directions of providing a fire prevention system on the enterprise.
37. Describe the role and components of the fire-fighting system at the enterprise.
38. To characterize the role and components of the system of organizational and technical fire prevention measures on the enterprise.
39. Analyze legislation on labor protection in Ukraine. Liability for violations legislation on OP.
40. Explain the content and scope of the Law of Ukraine "On Labor Protection".
41. To analyze the main principles of state policy on OP in Ukraine from the point of view of employees and officials of enterprises and organizations.
42. To characterize and evaluate the guarantees of the rights of employees to OP.
43. Analyze the system and effectiveness of departmental and public control over OP.
44. Purpose, objects, subjects and main tasks of the labor protection management system at the enterprise (in the organization)
45. Give a brief description of the functions of labor protection management in the organization
46. Analyze the general structure and typical principles of system functioning labor protection management at the enterprise
47. Assess the role and importance of accounting, analysis and assessment of working conditions in the hygiene management system and occupational safety at the enterprise
48. Evaluate the role and significance and analyze the main principles and types of control over state of protection.
49. Describe the duties and functions of the employer in relation to organization and coordination works on labor protection management.
50. Formulate and analyze the algorithm for assessing the risks of economic and financial losses, related to working conditions and safety;

51. List and comment on options for using indicators of a high level of occupational safety, provision of services and products in the marketing strategy of the enterprise;
52. To propose the main provisions of the job description of the head of the enterprise division  
(of the workforce), dedicated to the functions and responsibilities related to provision labor safety
53. To substantiate the reasons and necessity of certification of typical workplaces according to the conditions labor
54. Compare the purpose and content of production certification and certification of workplaces according to working conditions
55. Outline the procedure for actions of the head of works (subdivision) in the event of an accident
56. Define the objects and characterize the functions and tasks of insurance subjects from accidents and occupational diseases
57. Formulate the procedure for carrying out accident insurance (actions the insured and the insured person). Insurance case and grounds for insurance payments and compensations
58. Formulate the conditions of receipt and the types of insurance benefits that you can count on employee (family) in case of his injury, occupational disease or death.

### **Section 3. Civil protection of the population and territories**

59. State and comment on the meaning and role of the components of the legal basis of civil protection people
60. Subjects of provision and principles of implementation of civil protection
61. The main tasks and structure of the unified state system of civil protection (ESCSZ)
62. Formulate the rights and obligations of citizens of Ukraine in the field of civil protection
63. General principles of education and training of the population for actions in emergency situations
64. Functional duties and procedures of heads of divisions of enterprises and organizations in conditions of emergency situations, special and martial law
65. To describe emergency situations of a natural nature and their consequences
66. Explain the assessment of the classification of protective structures of civil defense according to their properties. To provide characteristics of classes and groups of public education institutions
67. Explain the life support measures for victims in emergency zones, on evacuation routes and in places of accommodation of the evacuated population, according to established norms and standards
68. Describe the types of evacuation depending on the features of the emergency.
69. Analyze the structure of the organization of civil protection at the object of economic activity
70. To determine the tasks and functional responsibilities of business entities in the civil sphere protection
71. Define and explain the complex of organizational and protective measures in the field of HC at the facility business activity
72. General principles of education and training of the population for actions in emergency situations

73. Functional duties and procedure of actions of heads of divisions of enterprises and organizations in conditions of emergency situations, special and martial law

74. List the algorithm of actions of different categories of the population when alerted about a threat or occurrence emergency situation of a special and military state

75. To provide an algorithm of behavior for the civilian population who found themselves in the war zone (at threat of attack by small arms, air danger)

**Working program of the academic discipline (syllabus):**

**Compiled** by associate professor, candidate technical Sciences, N.A. Prakhovnik.

**Approved** by the Department of Occupational Safety, Industrial and Civil Safety (protocol No. 14 dated 09.06.2021)