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MINISTRY OF SCIENCE AND HIGHER EDUCATION OF THE RUSSIAN FEDERATION

Federal State Autonomous Educational Institution of Higher Education

"Moscow Polytechnic University"

APPROVE
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"_____" 2025

WORKING PROGRAM OF THE DISCIPLINE

"Life Safety"

Field of study
38.03.02 Management

Educational program (profile)
"Business Process Management"

Qualification (degree)
Bachelor

Form of study
Part-time

Moscow 2025

Developer(s):

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Content

1. Goals, objectives and planned learning outcomes in the discipline……..……..…4
2. The place of discipline in the structure of the educational program…….4
3. Structure and content of the discipline…….……4
3.1. Types of educational work and labor intensity……..……...4
3.2. Thematic plan for studying the discipline…….……5
3.3. Contents of the discipline…….…….9
3.4. Topics of seminars/practical and laboratory classes……8
3.5. Subjects of course projects (coursework)……..…..8
4. Educational, methodological and information support…….8
4.1. Regulatory documents and GOSTs…….…….8
4.2. Main literature…….…9
4.3. Additional literature……9
4.4. Electronic educational resources……..9
4.5. Licensed and freely distributed software.....9
4.6. Modern professional databases and information reference systems……9
5. Logistics…….…..…9
6. Guidelines…….……10
6.1. Methodological recommendations for teachers on organizing training.....10
6.2. Guidelines for students on mastering the discipline……112
7. Fund of assessment funds……..……...11
7.1. Methods of monitoring and assessing learning outcomes……..…….11
7.2. Scale and criteria for assessing learning outcomes……..……...123
7.3. Evaluation tools…….…...14

1. Goals, objectives and planned learning outcomes in the discipline

The main goals of mastering the discipline “Life Safety” include the following:

- Formation in students of a general understanding of the inextricable unity of effective professional activity with the requirements for human safety and security. The implementation of these requirements guarantees the preservation of human performance and health, prepares him for action in extreme conditions.

The main objectives of mastering module 1 “Life Safety” include:

- Formation of basic knowledge about existing environmental threats and its negative factors;
- Study of behavior patterns in situations that threaten human life and health;
- Use of modern methods of preventing hazards;
- Developing skills in providing first aid and ensuring human safety;
- Study of the rules and regulations for ensuring human safety.

Training in the discipline “Life Safety” is aimed at developing the following competencies in students:

Code and name of competencies	Indicators of Competency Achievement
UK-8. Is able to create and maintain safe living conditions in everyday life and professional activities to preserve the natural environment, ensure sustainable development of society, including in the event of the threat and occurrence of emergencies and military conflicts	IUK-8.1.Analyzes and identifies factors of harmful influence on the life of elements of the environment (technical means, technological processes, materials, buildings and structures, natural and social phenomena), as well as dangerous and harmful factors within the framework of the activities carried out IUK-8.2.Understands the importance of maintaining safe working and living conditions, preserving the natural environment to ensure sustainable development of society, including the threat of dangerous or emergency situations and military conflicts IUK-8.3.Explains the rules of behavior in the event of emergencies of natural and man-made origin and military conflicts, describes ways to participate in recovery activities

2. Place of discipline in the structure of the educational program

The discipline “Life Safety” is one of the academic disciplines of the compulsory part of Block 1 “Disciplines (modules)” and is included in the educational program for preparing bachelors in all areas of training for all forms of study.

3. Structure and content of the discipline

The total complexity of module 1 “Life Safety” is 2 credit unit(s) (72 hours).

3.1 Types of educational work and labor intensity

3.1.1. Part-time education

No.	Type of educational work	Number of hours	Semesters	
			5	
1	**Auditory lessons**	**18**	**18**	
	Including:			
1.1	Lectures	6	6	
1.2	Seminars/practical sessions	6	6	
1.3	Laboratory exercises	6	6	
2	**Independent work**	**54**	**54**	
	Including:			
2.1	Essay			
3	**Interim certification**			
	Test/differential test/exam	**test**	**test**	
	Total	**72**	**72**	

3.2 Thematic plan for studying the discipline

(According to forms of study)

3.2.1. Part-time education

No. p/p	Sections/topics disciplines	Labor intensity, hour					
		Total	Classroom work				Independent work
			Lectures	Seminars/ practical sessions	Laboratory exercises	Practical training	
1.1	Topic 1.Introduction. Man and technosphere.	18					9
1.2	Topic 2.Psychophysiological and ergonomic foundations of safety.						9
1.3	Topic 3. Identification of harmful and dangerous environmental factors	17	1	3	3		10
1.4	Topic 4. Human exposure to harmful and dangerous environmental factors. Protection of humans and the environment from harmful and dangerous factors of natural, anthropogenic and techno genic origin	18	2	3	3		10
1.5	Topic 5. Providing comfortable conditions for human life and activity	7	1				6
1.6	Topic 6. Emergency situations and methods of protection in the conditions of their implementation	7	1				6
1.7	Topic 7. Life safety management	5	1				4
	Total	72	6	6	6		54

3.3 Contents of the discipline

Module 1. Life safety

Topic 1. Introduction. Man and technosphere

Basic concepts and definitions.

Characteristic states of the “man – environment” system: industrial, urban, domestic, natural environment. Human interaction with the environment, the basics of optimal interaction: comfort, minimizing negative impacts, sustainable development of the system.

Correspondence of living conditions to the physiological, physical and mental capabilities of a person. Basics of optimizing living environment parameters (microclimate parameters, lighting, noise, vibration, etc.). Criteria for assessing the impact of discomfort, their significance. An axiom about the potential impact in the “person – environment” system. Criteria for assessing the negative impact: number of injured and dead, reduction in life expectancy, material damage and their significance. International cooperation in the field of life safety.

Topic 2. Psychophysiological and ergonomic foundations of safety

The main psychological reasons for mistakes and the creation of dangerous situations. Engineering psychology. Factors influencing the reliability of operators' actions. Types of labor activity: physical and mental labor, forms of physical and mental labor, creative work. Classification of working conditions according to the severity and intensity of the labor process. Classification of working conditions according to production environment factors. Ergonomic fundamentals of safety. System "man - machine - environment". Anthropometric, sensorimotor, energetic, biomechanical and psychophysiological compatibility of man and machine. Organization of the workplace. Work and rest schedule, the main ways to reduce fatigue and monotony.

Topic 3. Identification of harmful and dangerous environmental factors

Classification of negative factors of natural, anthropogenic and technogenic origin. Harmful and dangerous negative factors. Systems of perception and compensation by the human body of harmful environmental factors. Maximum permissible levels of dangerous and harmful factors - the main types and principles of establishment. Parameters, characteristics of the main harmful and dangerous factors of the human environment, the main components of the technosphere and their sources.

Topic 4. Human exposure to harmful and dangerous environmental factors. Protection of humans and the environment from harmful and dangerous factors of natural, anthropogenic and technogenic origin

The impact of the main negative factors on humans and their maximum permissible levels.

Basic principles of protection against hazards. Systems and methods for protecting humans and the environment from the main types of hazardous and harmful effects of natural, anthropogenic and technogenic origin. Methods of protection from harmful substances, physical fields, information flows, dangers of biological and psychological origin. General characteristics and classification of protective equipment. Methods of control and monitoring of hazardous and harmful factors. Basic principles and stages of control and forecasting. Methods for determining areas of action of negative factors and their levels.

Protection against industrial vibrations. Basic concepts and definitions. Physical characteristics of vibrations. Causes and sources of vibrations. The effect of vibrations on the human body. Hygienic and technical standardization of vibrations (GOST 12.2.012). Methods and means of protection against vibration (impact on the source of excitation, vibration damping, dynamic vibration damping, passive and active vibration isolation). Personal vibration protection equipment. Measurement of vibration parameters.

Protection from industrial noise, infra- and ultrasound. Basic concepts and definitions. Physical characteristics of noise. Sources of noise and their classification (GOST 121.1.029). Effects of noise on the human body. Graph of human perception of acoustic sounds. Noise regulation in workplaces (GOST 12.1.003). Methods and means of protection against industrial noise (sound insulation and sound absorption, noise mufflers). Methods and means of protection against infra- and ultrasound. Noise characteristics of machines. Acoustic calculation.

Protection from EM fields and IR radiation, laser radiation, ionizing radiation. Impact of electromagnetic radiation on humans. Standardization, basic characteristics, protection from EM fields, IR radiation, laser and ionizing radiation.

Basics of electrical safety. Basic concepts and definitions. Factors influencing the outcome of electric shock. The effects of electric current on the human body. Classification of premises according to electrical safety. The phenomenon of current flowing into the ground. Touch tension. Step voltage.

Analysis of electrical networks and electric shock in various networks. Protective grounding, grounding, protective shutdown. Static electricity and its effect on humans. Lightning protection.

Safety of production equipment. Ergonomic requirements for equipment. Taking into account safety requirements during production preparation. Fencing, warning devices, blocking and signaling devices, remote control systems. Safety of operation of automated and robotic production. Safety in emergency situations. Testing, checking equipment compliance with safety requirements. Inspections and tests of compressors, cranes and hoists, gas supply systems, heating, ventilation, pressure systems. Ergonomic requirements. Increased safety through functional diagnostics of machines and installations.

Fire safety. Basic concepts and definitions. Dangerous and harmful factors of fires and explosions. The reasons for their occurrence. Fire prevention. Fire forecasting. Analysis of combustion termination conditions. Fire extinguishing agents. Their characteristics and scope. Fire notification and alarm systems.

Topic 5. Providing comfortable conditions for human life and activity

The relationship between living conditions and health and labor productivity. Comfortable (optimal) living conditions. Climatic, air, light, acoustic and psychological environments, the influence of the environment on well-being, health and human performance. Psychophysiological and ergonomic conditions of organization and labor safety. Principles, methods and means of organizing comfortable living conditions.

Improving the air environment in industrial premises. Basic concepts and definitions: working area, meteorological conditions and the parameters that determine them. Impact of microclimate parameters on humans. Analysis of heat balance conditions. Standardization of microclimate parameters (GOST 12.1.005). Air pollution in the working area and the impact on the human body. Standardization of the content of harmful substances in the air of the working area. Organization of air exchange in production premises. Ventilation system, requirements for ventilation systems. Determination of the required amount of air for general and local ventilation. Air conditioning.

Heating of industrial premises.

Industrial lighting. Basic concepts and definitions. Basic lighting quantities and units of measurement. Classification of lighting systems. Requirements for industrial lighting. Electric light sources and lighting devices. Standardization of artificial and natural lighting (SNiP 23-05-95). Personal eye protection equipment. Calculation methods.

Topic 6. Emergency situations and methods of protection in the conditions of their implementation

Basic concepts and definitions, classification of emergency situations and economic objects by potential danger. Phases of development of emergency situations. Damaging factors of sources of man-made emergency situations. Classification of natural disasters (natural disasters), man-made accidents. Characteristics of damaging factors of natural emergencies. Man-made accidents – their features and damaging factors. Emergency situations in peacetime and wartime and their damaging factors. Types of weapons of mass destruction, their characteristics and consequences of their use. Terrorism and terrorist activities. Methods for forecasting and assessing the situation in emergency situations. Sustainability of functioning of economic facilities in emergency situations. Principles and methods of increasing the sustainability of the functioning of facilities in emergency situations. Fundamentals of organizing the protection of the population and personnel in peacetime and war, methods of protection, protective structures, their classification. Organization of evacuation of the

population and personnel from emergency zones. Medical assistance activities. Personal protective equipment and the procedure for their use. Basics of organizing emergency rescue operations.

Topic 7. Life safety management

Legislative and regulatory legal framework for life safety management. Systems of legislative and regulatory acts regulating issues of environmental, industrial, production safety and safety in emergency situations, civil defense. Characteristics of the main legislative and regulatory acts: purpose, objects of regulation and main provisions. Economic foundations of safety management. Modern market methods of economic regulation of various aspects of security: positive and negative methods of stimulating security. The concept of economic damage, its components and methodological approaches to assessment. Financial liability for violation of environmental, industrial and production safety requirements. Risk insurance: environmental insurance, liability insurance for owners of hazardous production facilities, professional risk insurance, social insurance Basic concepts, functions, tasks and principles of risk insurance. State security management bodies: management, supervision and safety control bodies, their main functions, rights and responsibilities, structure. RSChS and civil defense system.

Corporate management in the field of environmental safety, working conditions and employee health: main objectives, principles and management systems (environmental management, occupational safety and employee health management).

3.4 Topics of seminars/practical and laboratory classes

3.4.1. Seminars/practical sessions

Module 1. Life safety

Topic 3. Identification of harmful and dangerous environmental factors

Topic 4. Human exposure to harmful and dangerous environmental factors. Protection of humans and the environment from harmful and dangerous factors of natural, anthropogenic and technogenic origin

Topic 5. Providing comfortable conditions for human life and activity

3.4.2. Laboratory exercises

Module 1. Life safety

Topic 3. Identification of harmful and dangerous environmental factors

Laboratory work 1. Research and calculation of artificial and natural lighting

Laboratory work 2. Study of meteorological conditions in the workplace

Topic 4. Human exposure to harmful and dangerous environmental factors. Protection of humans and the environment from harmful and dangerous factors of natural, anthropogenic and technogenic origin

Laboratory work 3. Noise protection in the workplace

Laboratory work 4. Research and calculation of protective grounding.

3.5 Subjects of course projects (coursework)

Not provided.

4. Educational, methodological and information support

4.1 Regulatory documents and GOSTs

1. SanPiN 2.1.3684-21 "Sanitary and epidemiological requirements for the maintenance of territories of urban and rural settlements, for water bodies, drinking water and drinking water supply, atmospheric air, soils, residential premises, operation of industrial and public premises, organization and implementation of sanitary anti-epidemic (preventive) measures."
URL: https://www.rospotrebnadzor.ru/files/news/SP2.1.3684-21_territorii.pdf

4.2 Main literature

1. Life safety: textbook [Electronic resource]. – M.: “Dashkov and Co,” 2015. – 453 p.
URL:http://www.knigafund.ru/books/211914

4.3 Additional literature

1. Aizman R.I., Shirshova V.M., Shulenina N.S. Fundamentals of life safety: textbook. [Electronic resource]/R.I. Aizman, V.M. Shirshova, N.S. Shulenina. - Siberian University Publishing House, 2010. - 256 p.
URL:http://www.knigafund.ru/books/178627

4.4 Electronic educational resources

1. An electronic educational resource on the discipline is under development.

4.5 Licensed and freely distributed software

Not provided.

4.6 Modern professional databases and information reference systems

1. Consultant Plus
URL:https://www.consultant.ru/
2. Information network "Techexpert"
URL:https://cntd.ru/

5. Logistics support

Lectures are held in university-wide classrooms, where films, slides or the use of handouts are provided. Laboratory work is carried out in specialized classrooms where laboratory installations and equipment are located (Av-5213, Av-5207).

	Laboratory work	Laboratory equipment
1	Study of meteorological conditions in the workplace	Laboratory setup with instruments. Aspiration psychrometer MV-4M, electronic anemometer with a vane sensor, air parameters meter "Meteoscope"
2	Research and calculation of artificial lighting	Laboratory stand "Efficiency and quality of lighting" BZH1M2, Combined device "TKA-PKM" Pulse meter + Lux meter
3	Noise measurement in workplaces	Sound level meter VSHV-003.

6. Guidelines

6.1 Methodological recommendations for teachers on organizing training

The main requirement for teaching the discipline is a creative, problem-based dialogue approach, which makes it possible to increase students' interest in the content of the educational material.

The main form of studying and consolidating knowledge in this discipline is lectures, laboratory and practical. The teacher must consistently read a series of lectures to students, during which they should focus on the key points of specific theoretical material, and also organize practical classes in such a way as to activate students' thinking, stimulate their independent extraction of the necessary information from various sources, comparative analysis of solution methods, comparison of the results obtained, formulation and argumentation of one's own views on many controversial issues.

The basis of training sessions in the discipline are lectures. In the process of teaching students, various types of training sessions (classroom and extracurricular) are used: lectures, seminars, laboratory work, consultations, etc. At the first lesson in this academic discipline, it is necessary to familiarize students with the procedure for studying it, reveal the place and role of the discipline in the system of sciences, its practical significance, inform students of the requirements of the department, and answer questions.

When preparing for lecture classes on the course "Life Safety", it is necessary to think over the plan for its implementation, the content of the introductory, main and final parts of the lecture, familiarize yourself with the latest educational and methodological literature, periodical publications on the topic of the lecture lesson, determine the means of logistical support for the lecture lesson and the order of their use during the lecture. Clarify the plan for conducting a practical lesson on the topic of the lecture.

During a lecture session, the teacher must name the topic, educational questions, and familiarize students with the list of basic and additional literature on the topic of the lesson.

In the introductory part of the lecture, justify the place and role of the topic being studied in the academic discipline, and reveal its practical significance. If this is not the first lecture being given, then it is necessary to link its topic with the previous one, without violating the logic of presentation of the educational material. The lecture should begin only by clearly defining its nature, topic and range of issues that will be considered during its course.

In the main part of the lecture, the content of educational issues should be revealed; students' attention should be focused on the main categories, phenomena and processes, and the features of their occurrence. Reveal the essence and content of various points of view and scientific approaches to explaining certain phenomena and processes. You should substantiate your own position on controversial theoretical issues. Give examples. Ask rhetorical questions as the lecture material is presented and answer them yourself. This helps to activate the mental activity of students, increase their attention and interest in the lecture material and its content. The teacher should guide students' work in taking notes of lecture material, emphasizing the need to reflect in the notes the main provisions of the topic being studied, especially highlighting the categorical apparatus.

In the final part of the lecture, it is necessary to formulate general conclusions on the topic, revealing the content of all the questions posed in the lecture. Announce the plan for the next seminar or laboratory lesson; give brief recommendations on preparing students for the seminar or laboratory work. Determine the place and time of consultation for students who wish to give reports and abstracts at the seminar on current issues of the topic under discussion.

The purpose of practical and laboratory classes is to ensure control of students' assimilation of educational material, expansion and deepening of the knowledge they acquired at lectures and during independent work. Increasing the effectiveness of practical classes is achieved by establishing

a creative environment that encourages students to express their own views and judgments on the issues under discussion, and the desire of students to work at the board when solving problems.

After each lecture, laboratory and practical lesson, make an appropriate entry in the students' class attendance logs; find out from the heads of study groups the reasons for students' absence from classes. Conduct group and individual consultations with students on issues that arise during their preparation for the current and intermediate certification in an academic discipline, recommend educational and other materials, as well as reference literature, to help.

The grade is assigned by the teacher and announced after the answer.

The teacher administering the test or exam is personally responsible for the correctness of the grade.

6.2 Guidelines for students on mastering the discipline

The student's work is aimed at:

- Study of theoretical material, preparation to practical classes, laboratory classes and performing practical work and laboratory work.
- Preparation and execution of testing using the general education portal
- Writing and defense of an abstract on the proposed topic

Independent work of students is the most important link in the educational process, without the proper organization of which a student cannot be a highly qualified graduate.

The student must remember that independent studies should begin from the first semester and be carried out regularly. It is very important to make every effort and willpower to force yourself to work at full capacity from the first day.

You should also not put off work due to a non-working mood or lack of inspiration. You need to create the mood yourself. Understanding the need to do work, knowing the goal, and understanding the prospects have a beneficial effect on mood.

Each student must plan his own independent work, based on his capabilities and priorities. This stimulates the completion of work, creates a calmer environment, which ultimately has a positive effect on the assimilation of the material.

It is important to take more fully into account the circumstances of your work, to understand what is most important at this stage, what sequence of work to choose in order to complete it better and with the least amount of time and energy.

For fruitful work, the environment and organization of the workplace are of no small importance. It is necessary to ensure that the place of work is as permanent as possible. Working in a familiar place makes it more fruitful. Work productivity depends on the correct alternation of work and rest. Therefore, every hour or two you should take a break for 10-15 minutes. It is better to devote weekends to active recreation, sports, walks in the fresh air, etc. Even switching from one type of mental work to another can serve as active recreation.

The student must remember that in the learning process the most important role is played by independent work with the book. Learning to work with a book is the most important task for a student. Without this skill, it will be extremely difficult to study program material, and a lot of time will be wasted. Working with a book consists of the ability to select the necessary books, understand them, take notes, select the main thing, assimilate and apply in practice.

7. Appraisal Fund

7.1 Methods for monitoring and assessing learning outcomes

Before the date of the intermediate certification, the student must complete all the work provided for in this work program of the discipline. The list of required works and the reporting form are presented in the table.

List of mandatory work performed during the semester in the discipline “Life Safety”

Type of work	Reporting and monitoring form
Laboratory works	Prepared reports (journal) of laboratory work provided for by the work program of the discipline with the teacher’s mark “passed” if all work is completed and completed.
Essay	Submit one essay on a chosen topic with the teacher’s grade “passed” if one essay is presented in the form of a presentation and on paper.
Testing	The teacher’s grade is “passed” if the test result on the scale (Appendix B) is more than 41%.

7.2 Scale and criteria for assessing learning outcomes

7.2.1. Abstract grading scale

Grading scale	Description
Excellent	All requirements for writing and defending an abstract have been met: the problem is identified and its relevance is justified, a brief analysis of various points of view on the problem under consideration is made and one’s own position is logically presented, conclusions are formulated, the topic is fully disclosed, the volume is maintained, the requirements for external design are met, the correct answers are given for additional questions.
Good	The basic requirements for the abstract and its defense have been met, but there are some shortcomings. In particular, there are inaccuracies in the presentation of the material; there is no logical consistency in judgments; the volume of the abstract is not maintained; there are omissions in design; Incomplete answers were given to additional questions during the defense.
Satisfactory	There are significant deviations from the abstracting requirements. In particular, the topic is only partially covered; there were factual mistakes in the content of the abstract or in answering additional questions; There is no output during protection.
Unsatisfactory	The topic of the abstract is not disclosed; a significant misunderstanding of the problem is revealed.

7.2.2. Test grading scale

The test result is assessed on a percentage rating scale.

Grade	Number of correct answers
Excellent	from 81% to 100%

Good	from 61% to 80%
Satisfactory	from 41% to 60%
Unsatisfactory	40% or less correct answers

7.2.2. Description of indicators and criteria for assessing competencies formed based on the results of mastering the discipline (module), description of assessment scales.

An indicator for assessing competencies at various stages of their formation is the achievement by students of the planned learning outcomes in the discipline (module).

Index	Not accepted	passed
To know: factors of harmful influence on the life of elements of the environment (technical means, technological processes, materials, buildings and structures, natural and social phenomena), as well as dangerous and harmful factors within the framework of the activities carried out	The student demonstrates a complete absence or insufficient compliance of the following knowledge: factors of harmful influence on the life of elements of the living environment (technical means, technological processes, materials, buildings and structures, natural and social phenomena), as well as dangerous and harmful factors within the framework of the activities carried out.	The student demonstrates full compliance with the following knowledge: factors of harmful influence on the life of elements of the living environment (technical means, technological processes, materials, buildings and structures, natural and social phenomena), as well as dangerous and harmful factors within the framework of the activities carried out, freely operates with acquired knowledge.
To be able to: apply methods of maintaining safe working and living conditions, preserving the natural environment to ensure sustainable development of society, including in the event of the threat of dangerous or emergency situations and military conflicts	The student does not know how or is insufficiently able to apply methods of maintaining safe working and living conditions, preserving the natural environment to ensure sustainable development of society, including in the event of the threat of dangerous or emergency situations.	The student demonstrates full compliance with the following skills: apply methods of maintaining safe working and living conditions, preserving the natural environment to ensure sustainable development of society, including in the event of the threat of dangerous or emergency situations.
To possess: - skills in explaining the rules of behavior in the	The student does not have or does not have enough skills to explain	The student is fully proficient in explaining the rules of behavior in the event of

event of emergencies of natural and man-made origin and military conflicts, describing ways to participate in recovery activities	the rules of behavior in the event of emergencies of natural and man-made origin and military conflicts, and to describe ways of participating in recovery activities.	emergencies of natural and man-made origin and military conflicts, and describing ways to participate in recovery activities.

7.3 Evaluation tools

7.3.1. Current control

7.3.1.1. Topics of essays on the discipline "Life Safety"

1. Subject, purpose and objectives of life safety.
2. Axioms about the potential danger of the technosphere.
3. Basic concepts and classification of risk. Acceptable risk.
4. Principles, methods and means of ensuring safety.
5. Protection when working with pressure vessels.
6. Characteristics of the main forms of human activity. Reliability of a person as a link in a complex technical system.
7. Production environment and working conditions. Dangerous and harmful production factors. Classification.
8. Industrial injuries, the main causes of industrial injuries.
9. Investigation and recording of accidents. Quantitative characteristics of injuries.
10. Air pollution in the working area of the production premises. The influence of harmful substances on the human body.
11. Standardization of the content of harmful substances in the air of production premises. Classification of harmful substances.
12. Microclimate parameters and their influence on the human body. Normalization of microclimate parameters.
13. Thermal exchange between humans and the environment.
14. Methods of protection from radiant heat sources.
15. Definition and types of ventilation. Requirements for the ventilation system.
16. Types of natural ventilation. The essence of aeration. Calculation of aeration.
17. Determination of airflow during aeration. Advantages and disadvantages of aeration.
18. Types of mechanical ventilation. Scheme.
19. Local ventilation.
20. Methods for calculating the amount of air in general ventilation.
21. Heating and air conditioning.
22. Tasks and classification of industrial lighting. Requirements for the lighting system.
23. Lighting characteristics of lighting. Standardization of artificial lighting.
24. Types of lamps. Their characteristics and functions.
25. Methods for calculating artificial lighting.
26. Types of natural industrial lighting. Calculation methods.
27. Noise. Basic characteristics of noise.
28. Noise classification (GOST 12.1.003). The effect of noise on the human body.
29. Noise regulation.
30. Methods and means of noise protection.

31. Methods of sound insulation and sound absorption.
32. Sources of infra- and ultrasound. Protection methods.
33. Definition of vibration. Sources and causes of vibration. Vibration classification (GOST 12.1.012).
34. Physical characteristics of vibration.
35. The effect of vibration on the human body. Technical and hygienic standardization of vibration (GOST 12.1.012).
36. Vibration protection methods.
37. Methods of vibration damping and vibration isolation.
38. Types of effects of electric current on the human body. Types of electrical injuries.
39. Factors influencing the outcome of electric shock to a person. Helping a person exposed to electric current.
40. The main causes of human injury from electric shock at work. Classification of industrial premises according to the degree of danger of electric shock.
41. Phenomena when electric current flows into the ground. Potential distribution on the earth's surface.
42. Touch tension. Step voltage.
43. Types of electrical networks. Analysis of electric shock in electrical networks.
44. Methods of protection against electric shock.
45. Protective grounding. Types of grounding devices. Standardization of resistance of grounding devices in electrical networks.
46. Protective grounding. Safety shutdown.
47. Protection from infrared and ultraviolet radiation.
48. Protection when working with lasers.
49. Protection against electromagnetic radiation.
50. Fire prevention. Measures taken to prevent fires in enterprises.
51. Combustion process. Factors necessary for the combustion process.
52. Categories of enterprises by fire hazard. Fire resistance and fire resistance limit of structures.
53. Fire safety measures that are carried out during the design of an industrial facility.
54. Fire extinguishing agents. Fire extinguishing agents.
55. Fire alarm.
56. Types and indicators of emergency situations.
57. General information about means of destruction during military operations.
58. Sustainability of functioning of economic facilities in emergency situations.
59. Basic ways to protect the population in emergency situations.
60. Elimination of consequences of emergency situations.
61. Life safety management. State and public supervision over the state of labor protection.
62. Organization of occupational safety at work.
63. System of occupational safety standards.
64. Organization of certification of workplaces based on working conditions.
65. Costs of protective measures for occupational safety.

7.3.1.2. Example of test tasks:

1. By definition, “Life safety is the science of comfortable and safe human interaction with ....”:

a) Technosphere;
b) Production environment;
c) Household environment;

d) Nature.

2. By definition, “Security is the state of the object of protection in which the impact on it of all flows of matter, energy and information does not exceed ……..”:

a) Limit values;

b) Maximum permissible values;

c) Minimum acceptable values;

d) Known values.

3. By definition, “Emergency situation (ES) is a condition in which, as a result of the occurrence of a source of emergency situation at an object, a certain territory or water area, the activities of people are disrupted, a threat arises to their life and health, damage is caused to the property of the population, the national economy and the environment":

a) Optimal living conditions;

b) Normal living conditions;

c) Minimum living conditions;

d) Normal living conditions.

7.3.2. Interim certification

7.3.2.1. Questions for the test in the Life Safety module:

1. Subject, purpose and objectives of life safety.
2. Axioms about the potential danger of the technosphere.
3. Basic concepts and classification of risk. Acceptable risk.
4. Principles, methods and means of ensuring safety.
5. Protection when working with pressure vessels.
6. Characteristics of the main forms of human activity. Reliability of a person as a link in a complex technical system.
7. Production environment and working conditions. Dangerous and harmful production factors. Classification.
8. Industrial injuries, the main causes of industrial injuries.
9. Investigation and recording of accidents. Quantitative characteristics of injuries.
10. Air pollution in the working area of the production premises. The influence of harmful substances on the human body.
11. Standardization of the content of harmful substances in the air of production premises. Classification of harmful substances.
12. Microclimate parameters and their influence on the human body. Normalization of microclimate parameters.
13. Thermal exchange between humans and the environment.
14. Methods of protection from radiant heat sources.
15. Definition and types of ventilation. Requirements for the ventilation system.
16. Types of natural ventilation. The essence of aeration. Calculation of aeration.
17. Determination of airflow during aeration. Advantages and disadvantages of aeration.
18. Types of mechanical ventilation. Scheme.
19. Local ventilation.
20. Methods for calculating the amount of air in general ventilation.
21. Heating and air conditioning.
22. Tasks and classification of industrial lighting. Requirements for the lighting system.
23. Lighting characteristics of lighting. Standardization of artificial lighting.
24. Types of lamps. Their characteristics and functions.
25. Methods for calculating artificial lighting.

26. Types of natural industrial lighting. Calculation methods.
27. Noise. Basic characteristics of noise.
28. Noise classification (GOST 12.1.003). The effect of noise on the human body.
29. Noise regulation.
30. Methods and means of noise protection.
31. Methods of sound insulation and sound absorption.
32. Sources of infra- and ultrasound. Protection methods.
33. Definition of vibration. Sources and causes of vibration. Vibration classification (GOST 12.1.012).
34. Physical characteristics of vibration.
35. The effect of vibration on the human body. Technical and hygienic standardization of vibration (GOST 12.1.012).
36. Vibration protection methods.
37. Methods of vibration damping and vibration isolation.
38. Types of effects of electric current on the human body. Types of electrical injuries.
39. Factors influencing the outcome of electric shock to a person. Helping a person exposed to electric current.
40. The main causes of human injury from electric shock at work. Classification of industrial premises according to the degree of danger of electric shock.
41. Phenomena when electric current flows into the ground. Potential distribution on the earth's surface.
42. Touch tension. Step voltage.
43. Types of electrical networks. Analysis of electric shock in electrical networks.
44. Methods of protection against electric shock.
45. Protective grounding. Types of grounding devices. Standardization of resistance of grounding devices in electrical networks.
46. Protective grounding. Safety shutdown.
47. Protection from infrared and ultraviolet radiation.
48. Protection when working with lasers.
49. Protection against electromagnetic radiation.
50. Fire prevention. Measures taken to prevent fires in enterprises.
51. Combustion process. Factors necessary for the combustion process.
52. Categories of enterprises by fire hazard. Fire resistance and fire resistance limit of structures.
53. Fire safety measures that are carried out during the design of an industrial facility.
54. Fire extinguishing agents. Fire extinguishing agents.
55. Fire alarm.
56. Types and indicators of emergency situations.
57. General information about means of destruction during military operations.
58. Sustainability of functioning of economic facilities in emergency situations.
59. Basic ways to protect the population in emergency situations.
60. Elimination of consequences of emergency situations.
61. Life safety management. State and public supervision over the state of labor protection.
62. Organization of occupational safety at work.
63. System of occupational safety standards.
64. Organization of certification of workplaces based on working conditions.
65. Costs of protective measures for occupational safety.