

Ministry of Science and Higher Education of the Russian Federation  
 Federal State Budgetary Educational Institution of Higher Education  
**Perm National Research Polytechnic University**

**APPROVED BY**

Pro-rector for Academic Affairs

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**ACADEMIC COURSE WORKING PROGRAM  
 OCCUPATIONAL SAFETY AND HEALTH**

**Academic course:** 21.03.01 Oil and Gas Engineering  
 (Name)

**Form of education:** Full-time studies  
 (Full-time /full-time – correspondence/correspondence)

**Level of higher education:** Bachelor's degree  
 (Bachelor's program/specialist program/  
 Master's program)

**Workload in hours (in credits):** 108 (3)  
 (Hours (CU))

**Training program (degree):** 21.03.01 Oil and Gas Engineering  
 (Code and denomination of degree)

**Direction:** Oil and Gas Engineering  
 (Title of curriculum)

## 1. GENERAL PROVISIONS

### 1.1. GOALS AND OBJECTIVES OF THE COURSE

The goal of the discipline is to gain knowledge about the normative and permissible levels of exposure to negative factors per person, study, classification and systematization of complex events, processes, phenomena in the field of ensuring safety and comfortable conditions for human activity,

development of measures to anticipate, localize and eliminate existing threats and dangers.

The tasks of the discipline are reduced to:

- analysis and development of identification methods (recognition and quantification) hazards, the sources of which are technical means, technological processes, materials, buildings and structures, elements of the technosphere, natural and social phenomena);

- development of principles and methods of protection against dangers, harmful and dangerous factors;

- development and rational use of means of protecting a person from negative the impact of man-made sources and natural phenomena, as well as the means to ensure comfortable conditions for human activity;

- development of measures to eliminate the consequences of the manifestation of hazards.

### 1.2. STUDIED OBJECTS OF THE COURSE

The complex of phenomena and processes in the system "man – technology – environment", negatively affecting this system

### 1.3. STARTING CONDITIONS

Unstipulated

## 2. PLANNED RESULTS OF THE COURSE TRAINING

<b>Compe- tence</b>	<b>Indicator's Index</b>	<b>Planned Results of the Course Training (to know, be able to, to master)</b>	<b>Indicator of Attaining Competence which the planned results of training are correlated with</b>	<b>Means of Assessment</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
<b>UC-8</b>	<b>IA-1uc.8.</b>	<b>To know</b> the level of requirements for creation and ensuring safe conditions of life activity; the code of behavior in cases of emergency situations	<b>Knows</b> the level of requirements to create and maintaining in everyday life and in professional safe conditions life activity; rules of conduct for threat and emergence emergencies	Test

1	2	3	4	5
UC-8	IA-2uc.g.	<b>To be able to</b> create and ensure safe conditions for life activity; observe the safety codes in the process of research work and in the field of professional activity; can behave in case of emergency situations.	<b>Is able to</b> to create and maintain safe living conditions to preserve natural environment, providing sustainable development society; follow technical rules security at research and development and in the area of professional activities; knows how to lead yourself when threatened and emergence emergencies	Laboratory report
UC-8	IA-3uc.g.	<b>To master skills</b> of the safety measures in the process of professional activity; creation and observance of safe conditions for life activity; has the experience of behavior in conditions of emergency situations	<b>Masters the skills</b> of the security in everyday life and performing work in field of professional activities; creation and respecting safe conditions life activity; owns skills in action threat and in conditions emergencies	Laboratory report

### 3. FULL TIME AND FORMS OF ACADEMIC WORK

Form of academic work	Hours in all	Distribution in hours according to semesters		
		Number of semester		
		5		
1. Holding classes (including results monitoring) in the form:				
1.1. Contact classwork, including:				
– lectures (L)	36	36		
– laboratory work (LW)	16	16		
– practice, seminars and/or other seminar-type work (PW)				
– control of self-work (CSW)	2	2		
– test				
1.2. Students' self-work (SSW)	54	54		
2. Intermediate attestation				
Exam				
Grading test	5	5		
Test (Credit)				
Course Project (CP)				
Course Work (CW)				
<b>Workload in hours</b>	<b>108</b>	<b>108</b>		



#### 4. COURSE OUTLINE

Name of the units with the course outline	Full time of classroom activity in hours according to the forms			Full time of extracurricular work in hours according to the forms
	L	LW	PW	SSW
1	2	3	4	5
<b>Semester 5</b>				
<p><b>Module 1. Theoretical basis of occupational safety and health</b></p> <p>Introduction to the discipline "OCCUPATIONAL SAFETY AND HEALTH". Basic terms and definitions. Tasks to ensure occupational health and safety. Society for Sustainable Development. Ensuring labor protection and industrial safety Concept and tasks of labor protection. Obligations of the employer and employee to ensure and comply with safe conditions and labor protection. The concept of a hazardous production facility. Industrial safety. Work safety culture. Bases of Standardization. The International Labor Organization (ILO). International Organization for Standardization (ISO). International cooperation in the field of security. The purpose and objectives of security. Legal and regulatory framework for security. Documents containing state regulatory requirements for labor protection. Occupational safety standards system. State safety authorities, their functions. Responsibility for violation of safety requirements.</p>	4	–	–	14
<p><b>Module 2. Occupational safety and health from harmful and (or) dangerous production factors, methods and means protecting the worker from them</b></p> <p>Microclimate. Heat transfer and the concept of heat balance. Microclimate concept. Principles of regulation and microclimate parameters. Assessment of working conditions. Methods and means of ensuring the requirements for the microclimate.</p> <p>Harmful substances and aerosols. Classification of harmful chemicals, aerosols, effects on the human body. Principles of regulation and parameters of harmful substances in the air of the working area. Hazard classes of harmful substances. Assessment of working conditions by indicators of the content of harmful chemicals. Methods and means of ensuring regulatory requirements for the air of the working area.</p> <p>Light environment. Shine. Lighting parameters. Characteristics of lighting quantities and units of measurement. Types and systems of industrial lighting. Natural, combined and artificial lighting, types, characteristics. Rationing principles and parameters light environment. Requirements for the light environment. Assessment of working conditions. Ensuring the requirements for the light environment, lighting devices.</p>	32	16	–	40

1	2	3	4	5
<p>Electromagnetic fields and radiation. General information about electromagnetic fields and radiation. Near and far zones of an electromagnetic wave, a plane electromagnetic wave. Principles of regulation and parameters of electromagnetic fields and radiation. Requirements for the parameters of electromagnetic fields and radiation (electrostatic field, constant magnetic field, electromagnetic field of industrial frequency, electromagnetic field of radio frequency). Assessment of working conditions by the parameters of electromagnetic radiation and fields. Methods and means of protection against electromagnetic fields and radiation.</p>				
<p>Noise. Sound. Physical characteristics of sound. Industrial noise, its sources, characteristics and noise classification. Addition of noise levels. Human exposure to noise. Noise level. Principles of noise levels. Equivalent noise level. Assessment of working conditions by noise parameters. Methods and means of protection against industrial noise. Vibration. Concept, characteristics and sources of vibration. The impact of vibration on the human body. Vibration classification. Principles of regulation and assessment of vibration impact. Frequency correction for general and local vibration. Assessment of working conditions by indicators of vibration impact. Methods and means of protection against vibration.</p>				
<p>Electrical safety. Electrical safety. Causes of Electric Shock. The effect of the current on the human body, factors affecting the outcome of the lesion. Basic measures to ensure electrical safety in the workplace. The main methods of first aid for victims of electric current.</p> <p>Ensuring safety during the operation of equipment. Hoisting mechanisms. Appointment, classification. The main hazards and conditions for their occurrence during the operation of lifting mechanisms. Basic safety measures when working with lifting mechanisms. Pressure equipment and systems. Operational and technological factors affecting the safe operation of pressure equipment. Basic measures to ensure the safety of pressure equipment.</p> <p>Fire safety. Fundamentals of the theory of combustion and explosion. Conditions and causes of fires. Methods and means of preventing fires. Classification fires and hazardous factors of fire. Fire safety equipment. Fire-fighting equipment.</p> <p>Conclusions. Social and legal responsibility for occupational health and safety. The purpose of the occupational health and safety management system. Cycle Plan-Do-Check-Act. Regulatory legal framework for labor protection. Risk-oriented competence. Civil (voluntary) and legal (compulsory) liability of the state, employers and workers.</p>				
<p>Total with regard to semester</p>	36	16	54	108
<p>Total with regard to the course</p>	36	16	54	108



### Topics of exemplary practical work

Sl.No	Topic of practical (seminar) work

Sl.No	Topic of laboratory work
1	Providing first aid to victims
2	Study of microclimate parameters and protection from thermal radiation
	Research on the efficiency and quality of artificial lighting
	Research of methods and means of protection against noise
5	Study of microwave radiation and the effectiveness of protective shielding
6	Research of methods and means of protection against industrial vibration
7	Study of the effectiveness of protective grounding in electrical installations with voltage up to 1000 V

## 5. ORGANIZATIONAL AND PEDAGOGICAL CONDITIONS

### 5.1. EDUCATIONAL TECHNOLOGIES USED FOR COMPETENCES FORMATION

Holding lectures in the discipline is based on the active method of training in the process of which students are not passive but active participants of the lesson answering questions of the teacher. Teacher's questions are aimed at activating the process of learning material as well as at the development of logical thinking. The questions stimulating associative thinking and connecting new material with the previous one are identified by the teacher in advance.

Laboratory classes are based on an interactive learning method in which students communicate not only with the teacher but also with each other. At the same time, students' activity in the learning process dominates. The teacher's place in interactive classes is reduced to orienting students' activities to achievement of the goals of studies.

Interactive lectures, group discussions, role-playing games, training sessions, and analysis of situations and simulation models are used in academic studies

### 5.2. STUDENTS' MANUAL FOR THE COURSE STUDY

Learning the course students are recommended to fulfill the following positions:

1. Learning of the discipline should be done systematically.
2. After learning one of the course unit with the help of the text-book or lecture notes it is recommended to reproduce in memory the basic terms, definitions, notions of the unit.

3. Special attention should be paid to the reports on practical studies, laboratory works and individual complex tasks for self-work.

4. The topic of questions studied individually is given by the teacher at the lectures. Also the teacher refers to the literary resources (first of all, to the newly published in periodicals) in order the students understand the problems touched on the lectures in detail.

## 6. LIST OF TEACHING MATERIALS AND INFORMATION SUPPLY FOR STUDENTS' SELF WORK IN THE DISCIPLINE

### 6.1. PAPER-BASED COURSEWARE

Sl.№	Bibliographic entry (author, title, mode of publication, place, publishing house, year of publication, number of pages )	Number of copies in the library
<b>1. Basic literature</b>		
1	Alli, Benjamin O. Fundamental principles of occupational health and safety / Benjamin O. Alli. – Geneva : Intern. labour office, 2001. – IX, 154 c.; 24 см.; ISBN 92-2-110869-4	Internet
<b>2. Additional literature</b>		
<b>2.1. Educational and scientific literature</b>		
1	Paland N., Schwedes R. Occupational Safety and Health in Germany : An Overview. Bonn : Federal Min. of Labour & Social Affairs, 1991. 95 p.	3
<b>2.2. Standardized and Technical literature</b>		
1	OHSAS 18001 «Occupational Health and Safety Management Systems – Specifications»	Internet
2	ISO 45001 “Occupational Health and Safety management systems”	Internet
<b>3. Students' manual in mastering discipline</b>		
1	Dolinina I.G. Forming occupational safety culture on the basis of development of students' risk-focused intellection / I.G. Dolinina, O.V. Kushnaryova // International journal of environmental & science education 2016, vol. 11, no.14, 6323-6334 <a href="http://www.ijese.net/makale_indir/IJESE_944_article_57d4490c2eaab.pdf">http://www.ijese.net/makale_indir/IJESE_944_article_57d4490c2eaab.pdf</a>	Internet
2	Dolinina I.G. Engineering Education for Forming Students' Risk-Oriented Consciousness / Dolinina I.G., Geykhman L.K., Kushnaryova O.V., Kazarenkov V.I. // International Journal of Engineering & Technology, 7 (4.38) (2018) 118-121, URL: <a href="https://www.sciencepubco.com/index.php/ijet/article/view/24335">https://www.sciencepubco.com/index.php/ijet/article/view/24335</a>	Internet
<b>4. Teaching and learning materials for students' self work</b>		



## 6.2. ELECTRONIC COURSEWARE

Kind of literature	Name of training tool	Reference to information resource	Accessibility of EBN (Internet/local net; authorized free access )
Book	Exposure Science in the 21st Century: A Vision and a Strategy. Committee on Human and Environmental Exposure Science in the 21st Century; Board on Environmental Studies and Toxicology; Division on Earth and Life Studies; National Research Council. Washington (DC): National Academies Press (US); 2012 Sep 7.	<a href="https://www.ncbi.nlm.nih.gov/books/NBK206806/">https://www.ncbi.nlm.nih.gov/books/NBK206806/</a>	Internet
Book	On the buses: a mixed-method evaluation of the impact of free bus travel for young people on the public health. Green J, Steinbach R, Jones A, et al. Southampton (UK): NIHR Journals Library; 2014 Feb. (Public Health Research, No. 2.1.)	<a href="https://www.ncbi.nlm.nih.gov/books/NBK206806/">https://www.ncbi.nlm.nih.gov/books/NBK206806/</a>	Internet

## 6.3. LICENSE AND FREE DISTRIBUTED SOFTWARE USED IN THE COURSE EDUCATIONAL PROCESS

Type of Software	Software branding
OS	Windows 10 (Azure Dev Tools for Teaching)
Office Applications	Adobe Acrobat Reader DC
Image processing software	Corel CorelDRAW Suite X4
General purpose application software	Mathematica Professional Version (license L3263-7820*)
General purpose application software	Microsoft Office Visio Professional 2016 (Azure Dev Tools for Teaching)
General purpose application software	WinRAR (license №879261.1493674)
Management systems for projects, research, development, design, modeling and implementation	Autodesk AutoCAD 2019 Education Multi-seat Stand-alone

## 6.4. MODERN PROFESSIONAL DATA BASES AND INQUIRY SYSTEMS USED IN THE COURSE EDUCATIONAL PROCESS

Branding	Reference to information resource
Scopus database	<a href="https://www.scopus.com/">https://www.scopus.com/</a>
Web of Science Database	<a href="https://www.webofscience.com/">https://www.webofscience.com/</a>
Scientific electronic library database (eLIBRARY.RU)	<a href="https://elibrary.ru/">https://elibrary.ru/</a>
Scientific Library of the Perm National Research Polytechnic University	<a href="https://lib.pstu/">https://lib.pstu/</a>
Lan Electronic Library System	<a href="https://e.lanbook.com/">https://e.lanbook.com/</a>
Electronic library system IPRbooks	<a href="https://www.iprbookshop.ru/">https://www.iprbookshop.ru/</a>
Information resources of the Network ConsultantPlus	<a href="https://www.consultant.ru/">https://www.consultant.ru/</a>
Company database EBSCO	<a href="https://www.ebsco.com/">https://www.ebsco.com/</a>



## 7. LOGISTICS OF THE COURSE EDUCATIONAL PROCESS

Type of classes	Name of the necessary basic equipment	Number of units
Lecture audience	Multimedia complex consisting of: multimedia projector, acoustic system.	1
Laboratory work	Laboratory facilities: "First aid victims"; "Research of parameters microclimate and protection against thermal radiation"; "Research on efficiency and quality artificial lighting"; "Research of methods and means of protection against noise"; "Research of methods and means of protection against vibration"; "Research of microwave radiation and the effectiveness of protective shielding"; "Study of the effectiveness of the protective grounding in electrical installations with voltage up to 1000 V". Computer.	1

## 8. FUND OF THE COURSE EVALUATING TOOLS

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## **FUND OF ESTIMATING TOOLS**

**For students' midterm assessment in the discipline  
"Occupational safety and health"**

*Supplement to the Academic Course Working Program*

<b>Training program</b>	21.03.01 Oil and Gas Engineering
<b>Direction (specialization) of educational program</b>	Oil and Gas Engineering
<b>Graduate qualification</b>	Bachelor's degree
<b>Graduate academic chair</b>	Oil and Gas Technology
<b>Form of study</b>	Full-time studies

**Year (-s):** 3

**Semester:** 5

**Workload:**

in credits: 3 CU

in hours: 108 h

**The form of midterm assessment:**

Test 5 semester



**Fund of estimating tools** for midterm assessment of students' learning the subject "**Occupational safety and health**" is the part (supplement) to the academic course working program. Fund of estimating tools for midterm assessment of students' learning the discipline has been developed in accordance with the general part of the fund of estimating tools for midterm assessment of the basic educational program which determines the system of the midterm assessment results and criteria of putting marks. Fund of estimating tools for midterm assessment of students' learning the subject determines the forms and procedures of monitoring results and midterm assessment of the subject leaning by the students.

### 1. LIST OF CONTROLLED RESULTS OF STUDYING DISCIPLINE, OBJECTS OF ASSESSMENT AND FORMS OF CONTROL

According to the Academic Course Working Program mastering course content is planned during one semester (the fifth semester of curriculum) and is divided into two educational modules. Classroom activities, lectures and laboratory work as well as students' self-work are provided for every module. In the frames of mastering course content such competences as *to know, to be able, to master* pointed out in the ACWP are formed. These competences act as the controlled results of learning the discipline "Occupational safety and health" (Table 1.1).

Monitoring of the acquired knowledge, abilities and skills is made in the frames of continuous assessment, progress check and formative assessment in the process of studying theoretical material, reports on laboratory works and during examination. Types of control is given in Table 1.1

Table 1.1 – List of controlled results of learning the discipline

Controlled results of learning the discipline (KAS)	Type of control					
	Continuous assessment		Progress check		Formative assessment	
	D	AC	LWR/ PWR	T/CW		Test
1	2	3	4	5	6	7
<b>Acquired knowledge</b>						
K.1 level of requirements for creation and ensuring safe conditions of life activity	+					Test
K.2 level of requirements for creation and ensuring safe conditions in professional activities	+					Test
K.3. code of behavior in cases of emergency	+					Test
<b>Acquired abilities</b>						
A.1 create and ensure safe conditions for life activity			+			Report
A.2 observe the safety codes in the process of research work and in the field of professional activity			+			Report
A.3. can behave in case of emergency situations			+			Report

1	2	3	4	5	6	7
<b>Mastered skills</b>						
S.1 safety measures in the process of professional activity				+		Test
S.2 creation and observance of safe conditions for life activity				+		Test
S.3 has the experience of behavior in conditions of emergency situations				+		Test

*D – topic discussion; AC – colloquium (discussion of theoretical material, academic conference); CT – case-task (individual task); LWR – report on laboratory work; PWR – report on practical work; T/CW – progress check (control work); TQ – theoretical question; PT – practical task; CT – complex task of grading test.*

Final assessment of the learned discipline results is the midterm assessment which is made in the form of test taking into consideration the results of the running and progress check.

## **2. TYPES OF CONTROL, STANDARD CONTROL TASKS AND SCALES OF LEARNING RESULTS ASSESSMENT**

Continuous assessment of the academic performance is aimed at maximum effectiveness of educational process, at monitoring students' specified competencies formation process, at increase of learning motivation and provides the assessment of mastering the discipline. In accordance with the regulations concerning the continuous assessment of the academic performance and midterm assessment of students taught by the educational programs of Higher education – programs of the Bachelor's Course, Specialists' and Master's Course the next types of students' academic performance continuous assessment and its periodicity is stipulated in PNRPU:

- acceptance test, check of the student's original preparedness and his correspondence with the demands for the given discipline learning;
- continuous assessment of mastering the material (the level of mastering the component "to know" defined by the competence) at every group studies and monitoring of lectures attendance;
- interim and progress check of students' mastering the components "to know" and "to be able" of the defined competences by computer-based or written testing, control discussions, control works (individual home tasks), reports on laboratory works, reviews, essays, etc.

Discipline progress check is conducted on the next week after learning the discipline module, while the interim control is made at every monitoring during the discipline module study;

- interim assessment, summarizing of the current students' performance at least once a semester in all disciplines for every training program (specialty), course, group;
- retained knowledge control.



## 2.1. CONTINUOUS ASSESSMENT OF EDUCATION

Continuous assessment of learning is made in the form of discussion or selective recitation on every topic. According to the four-point system the results of assessment are put into the teachers's note-book and are considered in the form of integral mark in the process of the midterm assessment.

## 2.2. PROGRESS CHECK

For the complex assessment of the acquired knowledge, abilities and skills (Table 1.1) progress check is carried out in the form of laboratory work presentation and midterm control works (after learning every discipline module).

### *2.2.1. Presentation of laboratory work*

It is planned 7 laboratory work all in all. Standard topics of laboratory work is given in ACWP.

Presentation of laboratory work is made by the student individually or by the group of students. Standard scale and criteria of assessment are given in the general part of FET of the educational program.

### *2.2.2. Midterm control work*

According to ACWP 2 midterm control works (CW) is planned to be realized after learning the educational modules of the discipline by the students.

The first CW is realized with respect to the module 1 "Theoretical basis of occupational safety and health", the second CW – with respect to the module 2 "Occupational safety and health from harmful and (or) dangerous production factors, methods and means protecting the worker from them".

#### **Standard tasks of the first CW:**

1. What fundamental knowledge do occupational safety and health need to have?
2. What are people in the field of occupational safety and health responsible for?
3. What is the meaning of the concept of the Society for Sustainable Development?
4. What does occupational safety and health mean?
5. What mission is of the International Labor Organization (ILO) and the International Organization for Standardization (ISO)?
6. What are the responsibilities of the employer and employee to ensure and comply with safe conditions and labor protection?
7. What are the signs of a hazardous production facility?
8. What are the basics of ensuring industrial safety?

### **Standard tasks of the second CW:**

1. Principles of regulation and microclimate parameters.
2. Principles of regulation and parameters of harmful substances in the air of the working area.
3. Characteristics of lighting quantities and units of measurement.
4. Assessment of working conditions by the parameters of electromagnetic radiation and fields.
5. Assessment of working conditions by noise parameters.
6. Frequency correction for general and local vibration.
7. Basic measures to ensure electrical safety in the workplace.
8. Operational and technological factors affecting the safe operation of pressure equipment.
9. The main methods of first aid for victims of electric current.
10. Basic measures of ensuring safety of pressure equipment.

Standard scale and criteria of the results of the midterm control work assessment are given in the general part of FET of the educational program.

### **2.3. FULFILLMENT OF THE COMPLEX INDIVIDUAL SELF-WORK TASK**

Individual complex task for the students is used for assessment their skills and abilities acquired in the process of learning the discipline in which the course project or course paper is not stipulated.

Standard scale and criteria of assessment of the individual complex task presentation are given in the general part of FET of the educational program.

### **2.4. MIDTERM ASSESSMENT (FINAL CONTROL)**

Admission for midterm assessment is made according to the results of continuous assessment and progress check. Preconditions for admittance are successful presentation of all laboratory works and positive integral estimation with respect to the results of continuous assessment and progress check.

#### ***2.4.1. Midterm assessment procedure without additional evaluation testing***

Midterm assessment is made in the form of test. Credit on the discipline is based on the results of the previously fulfilled by the student individual tasks on the given discipline.

Criteria of putting the final mark for the components of competences in the process of midterm assessment made in the form of test are given in the general part of FET of the educational program.



### **2.4.2. Midterm assessment procedure followed by evaluation testing**

In definite cases (for example, in case of re-attestation of the discipline) midterm assessment in the form of the test on this discipline can be made as the ticket-based evaluation test. Every ticket includes theoretical questions(TQ) aimed at control of the acquired knowledge, practical tasks (PT) aimed at mastered abilities, and complex tasks (CT) aimed at control of the acquired skills of all declared competences.

The ticket is formed so that the included questions and practical tasks could estimate the level of maturity of **all** declared competences.

#### **2.4.2.1. Standard questions and tasks the discipline testing**

##### **Standard questions for the acquired knowledge control:**

1. Objectives of ensuring occupational safety and health.
2. Obligations of the employer and employee to ensure safe conditions and labor protection.
3. Purpose and objectives of security.
4. Control principles and microclimate parameters.
5. Principles of regulation and parameters of the content of harmful substances in the air of the working area.
6. Characteristics of light quantities and units of measurement.
7. Principles of regulation and parameters of electromagnetic fields and radiation.
8. Principles for determining industrial noise levels, its sources, characteristics and noise classification.
9. Concept, characteristics and sources of vibration. The impact of vibration on the human body.
10. The effect of current on the human body, factors affecting the outcome of the lesion.
11. The main hazards and conditions for their occurrence during the operation of lifting mechanisms.
12. Classification of fires and fire hazards and fire safety equipment.
13. Regulatory legal framework for labor protection.
14. Social and legal responsibility for occupational health and safety.
15. The purpose of the occupational health and safety management system. Cycle Plan-Do-Check-Act.
16. Risk assessment methods.

##### **Standard complex tasks for the acquired skills control:**

1. Apply documents containing state regulatory requirements for labor protection.

2. Assessment of working conditions by indicators of the content of harmful chemicals.
3. Assessment of working conditions according to the norms and parameters of the light environment.
4. Assessment of working conditions by parameters of electromagnetic radiation and fields.
5. Assessment of working conditions by noise parameters.
6. Assessment of working conditions by indicators of vibration impact.
7. Safely operate electrical equipment.
8. Safely operate lifting equipment.
9. Provide production with fire safety equipment and control it.
10. Apply a health and safety management system.
11. Assessment of causes and results of hazardous industrial situations.

**Standard questions and practical tasks for the mastered abilities control:**

1. Methods of bringing to responsibility for violation of safety requirements.
2. Methods for ensuring the requirements for the microclimate.
3. Methods for ensuring regulatory requirements for air in the working area.
4. Methods for ensuring the requirements for the light environment, lighting devices.
5. Methods and means of protection against industrial noise.
6. Methods and means of protection against electromagnetic fields and radiation.
7. Methods and means of protection against vibration.
8. First aid methods for victims of electric shock.
9. Methods of ensuring the safety of equipment working under pressure and labor protection of workers.
10. Methods and means of preventing fires.
11. Methods of ensuring the safety of equipment working under pressure and labor protection of workers.
12. Methods and means of preventing fires.
13. Risk assessment methods.
14. Methods of application of laws and norms of the law to labor protection.
15. Methods for preventing unacceptable risk and compensating for the consequences.
16. Methods of Civil (voluntary) and legal (compulsory) liability of the state, employers and workers.



#### **2.4.2.2. Scales of test assessment of educational achievements**

Evaluation of discipline achievements in the form of maturity level of the components *to know, to be able, to master* of the declared competences is made according to the four-point assessment scale.

Standard scale and criteria of estimating educational achievements in the process of testing for the components *to know, to be able, to master* are given in the general part of FET of educational program.

### **3. ASSESSMENT CRITERIA FOR COMPONENTS AND COMPETENCES LEVEL OF MATURITY**

#### **3.1. ASSESSMENT OF COMPETENCES COMPONENTS LEVEL OF MATURITY**

While estimating the level of competences maturity by selective control in the process of testing it is considered that *the mark got for the components of the examined competence is combined with the corresponding component of all competences formed in the frames of the given academic course.*

General assessment of maturity level of all competences is made by aggregation of marks got by the student for each component of the formed competences taking into account the results of continuous assessment and progress check in the form of integral mark according to the four-point scale. All control results are put into the assessment sheet by the teacher according to the results of midterm attestation.

The form of the assessment sheet and requirements for its completion are given in the general part of FET of the educational program.

While making the final assessment of the midterm attestation in the form of test standard criteria given in the general part of FET of the educational program are used.