



## Syllabus of the educational component

Program of educational discipline

### Safety of labour

**Code and name of specialty**

161 Chemical technologies and engineering

**Institute**

Educational and Scientific Institute of Mechanical Engineering and Transport

**Educational program**

Technology of oil, gas and solid refining processes.

**Department**

Occupational and environmental safety(144)

**Level of education**

Bachelor

**Type of discipline**

Special (professional), Mandatory

**Semester**

7

**Language of teaching**

English

### Teachers, developers



**Yevtushenko Nataliia Serhiivna**

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Candidate of Technical Sciences, Associate Professor, Associate Professor of the Department of Occupational Safety and the Environment of NTU "KhPI"

The author of more than 200 scientific and educational and methodical publications. Leading lecturer on the courses: "Fundamentals of engineering training", "Organizational and technical support for the audit of workplaces in the field of labor protection", "Basics of professional activity and human health", "Occupational safety in professional activity", "Basics of ecology". <https://www.kpi.kharkov.ua/ukr/>

More information about the teacher on the website of the department

### General information

**Abstract**

The course examines the theoretical foundations of human life safety, the foundations of industrial safety and safe working conditions in production (the concept of labor protection, analysis and prevention of industrial injuries, sanitary and hygienic requirements for the state of the air environment, lighting of industrial premises, vibroacoustic factors of the industrial environment, general information about electrical safety and fire safety), protection of the population in emergency situations.

## **Purpose and objectives of the disciplines**

The student's acquisition of competence, knowledge, abilities and skills to carry out professional activities in the specialty, taking into account the risk of unwanted situations that may lead to adverse consequences at business facilities, as well as the formation of students' responsibility for personal and collective safety.

## **Format of classes**

Lectures, laboratory work. The study of the discipline ends with a credit.

## **Competences**

C01. Ability to abstract thinking, analysis and synthesis.

C02. Ability to apply knowledge in practical situations.

C03. Knowledge and understanding of the subject area and understanding of professional activity.

C06. The desire to preserve the environment.

C07. The ability to realize one's rights and responsibilities as a member of society, to realize the values of a 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.

C09. The ability to use the provisions and methods of fundamental sciences to solve professional problems.

## **Learning outcomes**

LO05. Develop and implement projects related to technologies and equipment of chemical industries, taking into account goals, resources, existing limitations, social and economic aspects and risks.

LO09. To ensure the safety of personnel and the environment during professional activity in the field of chemical engineering.

## **Scope of the discipline**

The total volume of the discipline is 90 hours. (3 ECTS credits): lectures – 16 hours, laboratory work – 16 hours, independent work – 58 hours.

## **Features of the discipline, methods and technologies of education**

Lectures are conducted interactively using multimedia technologies. In the laboratory classes use a project approach to learning, methods and forms of activation cognitive activity of students, attention is focused on the application of information technologies in labor safety studies. Study materials are available to students through OneNote Class Notebook.

## **Program of educational discipline**

### **Lecture topics**

**Topic 1. Safety of life - as a concept.**

Danger. Risk is an assessment of danger.

**Topic 2. Basics of safety of "man - machine - production environment" functioning.**

Psychology and security.

**Topic 3. The concept of labor protection.**



Purpose and object of study. Subject and tasks of the course. Analysis and prevention of industrial injuries.

**Topic 4. Air of the working area. Lighting of industrial premises.**

Sanitary and hygienic requirements for the state of the air environment. Meteorological working conditions. Technical safety measures of the labor process. Types and systems of industrial lighting. Requirements of sanitary regulations regarding their application. Standardization of natural and artificial lighting.

**Topic 5. Vibroacoustic factors of the industrial environment.**

Classification of noises by origin. Characteristics of noise parameters. Classification of vibrations. Impact of noise and vibration on the human body. Noise level measurement. Sanitary and hygienic regulation of noise and vibration. Measures and means of collective and individual protection against noise and vibration.

**Topic 6. Electrical safety.**

Causes of electric injuries. Effect of electric current on a person. Types of electrical injuries. Factors affecting the consequences of electric shock. Permissible values of currents and voltages. Phenomena during the flow of electric current into the ground. Step voltage and touch voltage. Classification of premises according to the degree of danger of electric shock.

**Topic 7. Fire safety.**

Physico-chemical basics of combustion. Indicators of fire and explosion hazard of substances and materials. Spontaneous ignition of substances. Characteristics of fire hazard of substances. Fire safety system. Fire protection system. Basic means of extinguishing fire

**Topic 8. Emergency situations of peacetime and wartime, their impact on the safety of life of the population of Ukraine.**

Protection of the population in emergency situations

### **Themes of laboratory work**

Topic 1. Quantitative assessment of risk.

Topic 2. Stress and its prevention.

Topic 3. Investigation of an accident at work. Provision of first aid in case of accidents.

Topic 4. Provision of first aid in case of accidents.

Topic 5. Study of the microclimate of industrial premises.

Topic 6. Study of lighting of industrial premises with natural light.

Topic 7. Study of industrial noise.

Topic 8. Selection and use of fire extinguishing agents for various objects.

### **Independent work**

Additional materials (textbooks) are recommended to students for independent study and analysis of issues submitted for independent study. The results are drawn up in a written report, presentations.

## **Literature and study materials**

### Basic literature

Basics of occupational safety and human health: textbook / V.V. Berezutskyi [etc.] ; ed. V.V. Berezutskyi; National technical University "Kharkiv Polytechnic Institute". – Kharkiv: NTU "KhPI", 2018. – 553 p. <http://repository.kpi.kharkov.ua/handle/KhPI-Press/37199>

Basics of occupational safety and health: textbook / Y.G. Masikevich et al. Chernivtsi: "MYSTO", 2023. 288 p. <https://repository.kpi.kharkov.ua/handle/KhPI-Press/65280>

Life safety workshop: study guide / K.O. Levchuk, O.A. Kryukovska., R.Ya. Romanyuk – Kamianske: DDTU, 2018. – 212 p. <https://www.dstu.dp.ua/Portal/Data/5/10/5-10-b5.pdf>



<p>Risk management of the use of equipment and technologies: a study guide for students of specialty 263 - Civil safety, educational program - Occupational safety / V.V. Berezutsky - NTU "KhPI", Kharkiv.: FOP Panov A.M. 2020. - 427 p. <a href="http://repository.kpi.kharkov.ua/handle/KhPI-Press/47595">http://repository.kpi.kharkov.ua/handle/KhPI-Press/47595</a></p>
<p>The procedure for investigating and keeping records of accidents, occupational diseases and accidents at work: Resolution of the Cabinet of Ministers of Ukraine No. 337 dated 04/19/2019. <a href="https://zakon.rada.gov.ua/laws/show/337-2019-%D0%BF#Text">https://zakon.rada.gov.ua/laws/show/337-2019-%D0%BF#Text</a></p>
<p>Methodical instructions for the laboratory work "Investigation of the microclimate of industrial premises" from the course "Fundamentals of occupational safety and human health": for students of all specialties. / editor: O. O. Kuzmenko, E. V. Yashcheritsyn, N. D. Ustinova, S. V. Kotlyarova; National technical University "Kharkiv Polytechnic Institute". - Kharkiv: A. M. Panov, 2020. - 36 p. <a href="https://repository.kpi.kharkov.ua/handle/KhPI-Press/49369">https://repository.kpi.kharkov.ua/handle/KhPI-Press/49369</a></p>
<p>Methodical instructions for practical classes "Calculations of vibration isolation in the field of mechanical engineering" from the discipline "Safety of production processes and equipment" for students of the specialty 263 "Civil safety" full-time and part-time study / comp. I.O. Mezentsseva, N.E. Movmyga, O.V. Osmanov - Kharkiv: NTU "KhPI", 2022. - 36 p. <a href="https://repository.kpi.kharkov.ua/handle/KhPI-Press/60341">https://repository.kpi.kharkov.ua/handle/KhPI-Press/60341</a></p>
<p>Methodical instructions for the laboratory work "Determining the lighting of premises with natural light" from the discipline "Fundamentals of occupational safety and human health": for students of all specialties. day and extracurricular forms of education / arranged by: L. A. Vaskovets, T. S. Bondarenko, E. V. Yashcheritsyn; National technical University "Kharkiv Polytechnic Institute". - Kharkiv: A. M. Panov, 2020. - 60 p. <a href="https://repository.kpi.kharkov.ua/handle/KhPI-Press/49286">https://repository.kpi.kharkov.ua/handle/KhPI-Press/49286</a></p>
<p>Methodical instructions for the laboratory work "Investigation of industrial noise" from the discipline "Fundamentals of occupational safety and human health": for students den. and extracurricular forms of education of all specialties / editor: O. M. Dreval, I. O. Mezentsseva, L. A. Vaskovets; National technical University "Kharkiv Polytechnic Institute". - Kharkiv: A. M. Panov, 2021. - 14 p. <a href="https://repository.kpi.kharkov.ua/handle/KhPI-Press/51624">https://repository.kpi.kharkov.ua/handle/KhPI-Press/51624</a></p>

#### Additional literature

<p>Safety in emergency situations: training. manual: in 2 parts. Part 1. Emergency situations / M. L. Lysychenko [and others]; ed. M. L. Lysychenko; Kharkiv. national technical University of Villages farm named after P. Vasylenko. - Kharkiv: PromArt, 2021. - 202 p. <a href="https://repository.kpi.kharkov.ua/handle/KhPI-Press/61871">https://repository.kpi.kharkov.ua/handle/KhPI-Press/61871</a></p>
<p>Safety in emergency situations: training. manual: in 2 parts. Part 2. Protection of the population and territories / M.L. Lysychenko [and others]; ed. M. L. Lysychenko; Kharkiv. national technical University of Villages farm named after P. Vasylenko. - Kharkiv: PromArt, 2021. - 200 p. <a href="https://repository.kpi.kharkov.ua/handle/KhPI-Press/61872">https://repository.kpi.kharkov.ua/handle/KhPI-Press/61872</a></p>



## Assessment system

### Criteria for assessing the student's success and distribution of points

100% of the final grade consists of assessment results in the form of credit (30%) and current assessment (70%).  
Assessment: written assignment (2 questions from theories + problem solving) and an oral report.  
Current rating:  
2 online tests (15% each), laboratory work (40%).

### Assessment scale

The sum of the points	National assessment	ECTS
90–100	Excellent	A
82–89	Good	B
75–81	Good	C
64–74	Satisfied	D
60–63	Satisfied	E
35–59	Unsatisfactorily (further study required)	FX
1–34	Unsatisfactorily (needs repeated study)	F

## Norms of academic ethics and policy of the course

The student must adhere to the Code of Ethics of Academic Relations and Integrity of NTU "KhPI": show discipline, education, benevolence, honesty, responsibility. Conflict situations should be openly discussed in study groups with the teacher, and if it is impossible to resolve the conflict, it should be brought to the attention of the employees of the institute's directorate.

Regulatory and legal support for the implementation of the principles of academic integrity of NTU "KhPI" is posted on the website: <http://blogs.kpi.kharkov.ua/v2/nv/akademichna-dobrochesnist/>

## Approval

The syllabus has been agreed

Date of approval, signature

Head of Department  
Sergij VAMBOL

20.09.2023



Date of approval, signature

Guarantor of the educational  
program  
Iryna SINKEVYCH

