



Syllabus

Program of educational discipline



Fundamentals of Occupational Safety and Health

Code and name of specialty

171 Electronics

Institute

Educational and Scientific Institute of Mechanical Engineering and Transport

Educational program

Electronics

Department

Occupational and environmental safety (144)

Level of education

Bachelor

Type of discipline

Special (professional), Mandatory

Semester

6

Language of teaching

English

Teachers, developers



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Ph.D., professor, head of the "Occupational and Environmental Safety" department. Teaching experience - 24 years. Member of the Educational and methodical commission of the Ministry of Education and Culture of Ukraine, specialty 183 "Technology of environmental protection". Author and co-author of more than 400 scientific and educational-methodological publications, the main courses he teaches: "Ecology", "Fundamentals of occupational safety and health", "Safety of work and professional activity".

Learn more about the teacher on the department's website

<https://web.kpi.kharkov.ua/safetyofliving/uk/zavedushei/>

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, practical works. The study of the discipline ends with a credit.

Competences

General competences

C14. The ability to preserve and multiply moral, cultural, scientific values and achievements of society based on understanding history and patterns of development of the subject area, its place in general system of knowledge about nature and society and in development society, techniques and technologies, use different types and forms of motor activity for active recreation and driving healthy lifestyle.

SC03. Ability to integrate knowledge of fundamental sections physics and chemistry to understand solid state processes, functional, energy and biomedical electronics, electrical engineering.

Learning outcomes

LO04. Evaluate the characteristics and parameters of materials electronic engineering, understand the basics of solid-state electronics, electrical engineering, analog and digital circuit engineering, converting and microprocessor technology.

LO06. Apply experimental skills (knowledge experimental methods and procedure experiments) to test hypotheses and study phenomena electronics, be able to use standard equipment, to plan, draw up schemes; analyze, model and critically evaluate the obtained results.

LO11. To argue the normative and legal principles at implementation of electronic devices and systems; evaluate advantages of engineering developments, their environmental friendliness and safety; defend one's worldview positions and beliefs in the workplace or social activity.

Scope of the discipline

The total volume of the discipline is 90 hours. (3 ECTS credits): lectures – 12 hours, practical works – 12 hours, independent work – 66 hours.

Features of the discipline, methods and technologies of education

Lectures are conducted interactively using multimedia technologies. In the practical 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.

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 practical work

Topic 1. Quantitative assessment of risk.

Topic 2. Stress and its prevention.

Topic 3. Provision of first aid in case of accidents.

Topic 4. Study of lighting of industrial premises with natural light.

Topic 5. The study of the ground connector's resistance to electric current flow.

Topic 6. Assessment of the situation in case of destruction of buildings and structures.

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

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| 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 |
| Safety of production processes and equipment. Part I. Organizational and technical measures of safety of the labor process: study guide for students of specialty 263 - Civil safety, educational program - Occupational safety / I.O. Mezentseva. - NTU "KhPI", Kharkiv, 2022. - 246 p. http://repository.kpi.kharkov.ua/handle/KhPI-Press/60344 |
| Guidelines for laboratory works on the topic "The study of the ground connector's resistance to electric current flow" for the course "Fundamentals of Occupational Safety and Health" [Electronic resource] : for students of all specialties, full-time and part-time study / comp.: I. O. Mezentseva, O. I. Illinska, N. S. Yevtushenko ; National Technical University "Kharkiv Polytechnic Institute". – Electronic text data. – Kharkiv, 2022. – 20 p. – URI: http://repository.kpi.kharkov.ua/handle/KhPI-Press/59769 . |
| Methodical guidelines for the implementation of the individual task "Calculation of room lighting" from the discipline "Fundamentals of occupational safety and human health" [Electronic resource]: for students of special. 263 "Civil Security", the educational program "Labor Protection", and for the independent work of students of all specialties. day and extracurricular forms of education / arranged by: T. S. Bondarenko [and others]; National technical University "Kharkiv Polytechnic Institute". - Electron. text. data. - Kharkiv, 2023. - 36 p. https://repository.kpi.kharkov.ua/handle/KhPI-Press/69075 |
| Guidelines for laboratory works on the topic "The study of the ground connector's resistance to electric current flow" for the course "Fundamentals of Occupational Safety and Health" [Electronic resource] : for students of all specialties, full-time and part-time study / comp.: I. O. Mezentseva, O. I. Illinska, N. S. Yevtushenko ; National Technical University "Kharkiv Polytechnic Institute". – Electronic text data. – Kharkiv, 2022. – 20 p. – URI: http://repository.kpi.kharkov.ua/handle/KhPI-Press/59769 . |

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| 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. https://repository.kpi.kharkov.ua/handle/KhPI-Press/49369 |
| 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. https://repository.kpi.kharkov.ua/handle/KhPI-Press/49286 |
| Safety in emergency situations: a method. instructions for practice. classes on the topic "Assessment of the situation in case of destruction of buildings and structures": for applicants of the first (bachelor's) level of full-time and part-time higher education. forms of education special 133 "Industrial mechanical engineering", 141 "Power engineering, electrical engineering and electromechanics"; author-compiler: R. V. Antoshchenkov, S. O. Vambol, N. P. Kundenko, S. O. Lyashenko, I. A. Cherepnev; DBTU. Kharkiv: [b. v.], 2023. 87 p. https://repo.btu.kharkov.ua/handle/123456789/31579 |
| Law of Ukraine "On Labor Protection" No. 229-IV (229-15) dated November 21, 2002; edition of 04.05.2015 No. 2694-12. |
| 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 of April 19, 2019. |
| DSN 3.3.6.042-99. Sanitary norms of the microclimate of industrial premises. |
| DBN V.2.5-67:2013. Heating, ventilation and air conditioning. |
| DBN V.2.5-28:2018. Engineering equipment of buildings and structures. Natural and artificial lighting. - K.: Ministry of Construction of Ukraine, 2018. |
| DSN 3.3.6.037-99. Sanitary norms of industrial noise, ultrasound and infrasound. |
| DSN 3.3.6.039-99. Sanitary norms of industrial general and local vibration. |
| NPAOP 40.1-1.32-01. Rules for the construction of electrical installations. Electrical equipment of special installations. - Approved by Order No. 272 of the Ministry of Labor and Social Policy of Ukraine dated June 21, 2001. |
| DSTU B V.1.1-36:2016. Determination of categories of premises, buildings and external installations according to explosion and fire hazard. - Approved by order of the Ministry of Regional Development of Ukraine dated June 15, 2016 No. 158. |
| Code of Civil Protection of Ukraine. – Approved by the Verkhovna Rada Resolution No. 5403-VI of October 2, 2012. Edition of 2018 |
| Додаткова література |
| The Constitution of Ukraine, adopted on June 28, 1996. |
| Hygienic classification of work according to indicators of harmfulness and dangerous factors of the production environment, difficulty and tension of the labor process. - Approved by the order of the Ministry of Health of Ukraine dated April 8, 2014 No. 248. |
| Civil defense: study guide /G. Yu. Bakhareva, N. E. Tverdokhlebova [and others] - Kharkiv: NTU "KhPI", 2015. - 115 p. |
| Safety in emergency situations [Text]: training. manual for students of higher of education: in 2 h. Part 1. Emergency situations / M. L. Lysychenko, V. V. Vambol, S. O. Vambol, M. M. Kiriyyenko, I. A. Cherepnyov, V. M. Vlasovets; under the editorship M. L. Lysychenka; Kharkiv. national technical University of Villages farm named after P. Vasylenko. - Kharkiv: PromArt, 2021. - 202 p. - Bibliogr. at the end of the chapter - ISBN 978-617-7634-97-2 http://repository.kpi.kharkov.ua/handle/KhPI-Press/61871 |
| Safety in emergency situations [Text]: training. manual for students of higher education: in 2 h. Part 2. Protection of the population and territories / M. L. Lysychenko, V. V. Vambol, S. O. Vambol, M. M. Kiriyyenko, I. A. Cherepnyov, V. V. Bredykhin; under the editorship M. L. Lysychenka; Kharkiv. national technical University of Villages farm named after P. Vasylenko. - Kharkiv: PromArt, 2021. - 200 p. - Bibliogr. at the end of the chapter - ISBN 978-617-7634-97-2 http://repository.kpi.kharkov.ua/handle/KhPI-Press/61872 |

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), practical 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
20.09.2023

Guarantor of the educational
program
Ольга БУТОВА