

Ministry of Education and Science of Ukraine
Sumy National Agrarian University
Faculty of Engineering and Technology
Department of Higher Mathematics and Physics

Syllabus of the educational component
___ MC 30 _LIFE SAFETY AND LABOR PROTECTION _
(required / optional)

Specialty	G 13 Food Technology
Educational	Food technology
Level of higher education	First (bachelor's)

Developer: Olga Vasilenko Olga Vasilenko, Associate Professor of the Department of Higher Mathematics and Physics
(signature)

Considered, approved and ratified at a meeting of the Department of Higher Mathematics and Physics	minutes of June 2, 2026 No. <u>13</u>
	Manager Department <u>[Signature]</u> (under <u>Vladyslav Gerasymenko</u>)

Agreed:

Guarantor of the educational program [Signature] Olena KOSHEL
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Dean of the faculty where the educational program is implemented [Signature] Nataliia BOLHOVA
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Review of the work program (attached) provided by: [Signature] Olena Koshel
(Full name)

[Signature] Anna HELIKH
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(signature) (full name)

Registered in the electronic database: date: 28.08. 2026.

1. GENERAL INFORMATION ABOUT THE EDUCATIONAL COMPONENT

1.	Name MC	Life safety and occupational health MC 30		
2.	Faculty/department	Department of Higher Mathematics and Physics		
3.	Status MC	Mandatory		
4.	Program/Specialty (programs), part of which is the MC for (<i>filled in for mandatory MCs</i>)	EP "Food Technologies", G 13 Food Technologies		
5.	NRC level	1st Bachelor's, 6th level		
6.	Semester and duration of study	2nd semester, 15 weeks		
7.	Number of ECTS credits	5		
8.	Total hours and their distribution	Contact work (classes)		Independent work
		Lectures 14	Practical work 44	92
	Total 150 hours			
9.	Language of instruction	Ukrainian		
10.	Teacher/Educational Component Coordinator	Ph.D. , associate professor Olga Vasylenko		
11.1	Contact information	vasylenko.sumy@gmail.com		
11.	General description of the educational component	Formation of the correct social position of a person regarding his own safety and safe behavior in everyday life, in production conditions and in emergency situations. Environment, preparation for actions in case of threat and in emergency situations in order to reduce potentially negative consequences. Instillation of practical skills for protecting life from the harmful and dangerous effects of environmental parameters and impact factors of the emergency zone.		
12.	Purpose of the educational component	acquisition of knowledge, skills and abilities (competences) to effectively solve professional tasks with mandatory consideration of occupational safety requirements and guaranteeing the preservation of life, health and working capacity of employees in various areas of professional activity.		
13.	Prerequisites for studying MC, connection with other educational components of EP	1. The educational component is the basis for the EP "Food Technologies": MC 3 2 Practice.		
14.	Academic Integrity Policy	- it is not allowed to copy the conclusions of the protocols of practical work from each other, in such a case, the practical work will be considered unprotected and will require re-revision . In case of re-revision, the work will not be evaluated for the maximum score; -copying the text of independent works from other students is not allowed; in such a case, the works will not be accepted for defense; -When writing final tests, students are not allowed to copy from each other or use gadgets; if this happens, a reduction in scores is provided.		
15.	Keywords	Hazardous factor, rules for providing first aid, lighting, noise, vibration, occupational hygiene, safety situation.		
16.	Link to the course in Moodle	https://cdn.snau.edu.ua/moodle/course/view.php?id=1438		

2. LEARNING OUTCOMES BY EDUCATIONAL COMPONENT AND THEIR RELATIONSHIP WITH PROGRAM LEARNING OUTCOMES

Learning outcomes in the discipline ¹	Program learning outcomes ²			How is RND assessed?
	PLO 7	PLO 13	PLO 16	
<u>DRN 1.</u> Ensuring an appropriate level of quality and safety during the performance of work.	X	X		Oral defense of practical work Multiple-choice final test (modular assessment) Exam
<u>DRN 2.</u> Knowledge of the basics of the Legislation of Ukraine on labor protection, the system of management and organization of labor protection at work, issues of organizing labor protection training and investigation of accidents at work, as well as methods of economic analysis of injuries ;	X	X	X	Oral defense of practical work Multiple-choice final test (modular assessment) Exam
<u>DRN 3.</u> Mastering the basics of industrial sanitation, standardization of industrial sanitation parameters and ensuring proper sanitary and hygienic working conditions, issues of safety and electrical safety of production, as well as the basics of fire safety during work ;	X		X	Oral defense of practical work Multiple-choice final test (modular assessment) Exam
<u>DRN 4</u> Implement technical and organizational measures to organize safe working conditions during production activities.	X			Oral defense of practical work Multiple-choice final test (modular assessment) Exam

¹The list that is given in the work program under "to know, to be able to".

When defining the DNR in the work program, you can not highlight "know, be able to", but give a general list.

²indicate the PRN numbers as they are given in the OP.

MANDATORY! The PNRs listed in the appendix must match the "+" ones listed in the PNR and OK correspondence matrix of the educational program.

3. CONTENT OF THE EDUCATIONAL COMPONENT (COURSE PROGRAM)

Topic. List of issues to be addressed within the topic	Distribution within the overall time budget		Independent work	Recommended reading ³
	Classroom work	Lab		
	Lecture			
1 Module				
Topic 1. Categorical and conceptual apparatus for life safety, taxonomy of hazards, risk as a quantitative assessment of hazards. Plan - Human security, society, national security. - Basic concepts and definitions. - Types of hazards: micro- and macro - biological, explosive , hydrodynamic, fire, radiation, physical, chemical, ecological. - Axioms of life safety. - Risk as a factor of potential dangers. - Taxonomy, identification and quantification of hazards. - Identification and assessment of the level of danger using probabilistic structural-logical models applied in the relevant industry . Topic 2. Natural threats and the nature of their manifestations and effects on people, animals, plants, and economic objects. Man-made hazards and their consequences. Man-made hazards and their consequences. Plan - Hazardous geological processes and phenomena. - Dangerous meteorological phenomena and processes. - Hazardous hydrological phenomena and processes. - Fires in natural ecosystems. - Biological hazards. - Technogenic hazards and their impact factors by genesis and mechanism of influence. - Mechanism of action of ionizing radiation on body tissues. - Classification, nomenclature and units of measurement of the impact factors of physical and chemical action of sources of technogenic hazards. - Industrial accidents, disasters and their consequences. - Dangerous transport incidents and accidents on transport communications. - Classification of radiation accidents by nature of action and scale.	2			[1,2,3-10]

³Specific source from the main or additionally recommended literature

Laboratory work 1 Task 1. Determining the biorhythms of human performance Task 2. Determining the level of human meteosensitivity		2		[5,3,4, 17,19,22]
Laboratory work 2 Task 1. Study of the methodology for the occurrence of non-industrial accidents Task 2. Assessment of a person's psychological qualities that affect the safety of activities		2		[5,3,4, 17,19,22]
Independent work Criteria for the transition of a dangerous event into an emergency, units of measurement of indicators of the classification feature of an emergency and their threshold values in the natural environment, production, transport and other spheres of life. Identification of potentially dangerous objects and territories. Mechanism of action of ionizing radiation on body tissues. Classification, nomenclature and units of measurement of the impact factors of physical and chemical action of sources of technogenic hazards			20	[1,2,3-10,12,15,18, 27]
Topic 3. Fire safety. Socio-political dangers, their types and characteristics. Plan 1. General concepts about the basics of the theory of development and cessation of combustion. 2. Stages of fire development. 3. Zones of combustion, heat exposure, smoke, toxicity. 4. Fire factors that are dangerous to humans. 5. Explosion. Factors of man-made explosions that lead to injury to people, destruction of buildings, structures, technical equipment and environmental pollution. 6. Classification of objects according to their fire hazard explosion hazard . 7. Global problems of humanity. 8. Socio-political conflicts involving the use of conventional weapons and means of mass destruction. Topic 4. Application of a risk-oriented approach to building probabilistic structural-logical models of the emergence and development of emergencies. Security management, legal support and organizational and functional structure of population protection and ATO in the Emergency Situations. Plan 1. General analysis of risk and security issues of complex systems. 2. Definition of basic events. 3. Risk identification 4. Basic principles and concepts regarding the protection of the population and ATO in emergencies.	2			[1,2,3-10,12,15,18, 2 3]

Laboratory work 3 Task 1. Stress and its prevention. Determining the level of human meteosensitivity Task 2. Research on the characteristics of human attention when processing information		4		[1,2,3-10,13,16]
Laboratory work 4 Task 1. Determining a person's chronotype Task 2. Study of harmful human habits as factors of social danger		2		[1,2,3-6,10,14,18]
Independent work Indicators of fire and explosion hazard of substances and materials. Types of terrorism, its primary, secondary and cascading factors affecting them. General risk analysis. Basic principles and concepts for protecting the population and ATO in emergencies.			20	[5,3,4,17,19,20]
Total for 1 Module	4	10	40	
2 Module				
Topic 5: General issues of labor protection. Legal and organizational foundations of labor protection. State management of labor protection, state supervision and public control over labor protection. Organization of labor protection at the enterprise. Training on labor protection Plan 1. Current state of occupational safety in Ukraine and abroad. 2. Main sections of the discipline "Fundamentals of Occupational Safety". 3. Constitutional principles of labor protection in Ukraine. 4. Law of Ukraine "On Labor Protection". 5. System of state management of occupational safety in Ukraine. 6. Structure, main functions and tasks of occupational health and safety management in the organization. 7. The enterprise's labor protection service. 8. Rights and obligations of occupational health and safety service employees. 9. Principles of organization and types of training on occupational safety. 10. Studying the basics of occupational safety in educational institutions and during vocational training. Topic 6: Prevention of injuries and occupational diseases. Fundamentals of physiology, occupational hygiene and industrial sanitation. General provisions . Plan 1. Industrial injuries, occupational diseases, industrial accidents. 2. Distribution of injuries by severity. 3. Fundamentals of labor physiology. 4. Occupational hygiene, its importance.	6			[1,2,3-6,7,10]

Laboratory work 5 Organization of occupational health and safety training		8		[1,2,3-6,10,14,18]
Laboratory work 6 Task 1. Procedure for conducting an investigation and keeping records of accidents, occupational diseases and industrial accidents (part 1) Task 2. Procedure for conducting an investigation and keeping records of accidents, occupational diseases and industrial accidents (part 2) Task 3. Research parameters microclimate		10		[1,2,3-10,13,16]
Independent work State labor protection supervision bodies, their main powers and rights. Training and testing of knowledge on occupational safety issues. Basic measures to prevent injuries and occupational diseases. Factors determining sanitary and hygienic working conditions.			30	[1,2,3-10,13,16]
Topic 7: Air in the working area. Parameters of the production area and premises. Noise, ultrasound and infrasound Plan 1. Work area and work area air. 2. Microclimate of the working area. Normalization and control of microclimate parameters. 3. Basic lighting definitions. 4. Classification of industrial lighting. 5. Sources, classification and characteristics of vibration. 8. Classification of noise by origin, nature, spectrum and time characteristics. 9. Sources, features and classification of electromagnetic radiation and electric and magnetic fields. 10. Industrial sources of ionizing radiation, classification and features of their use. 11. Hazard classes of enterprises according to sanitary standards. 12. Sanitary protection zones of enterprises. 13. Occupational safety requirements for the location of production and office equipment and the organization of workplaces. Topic 8: General safety requirements for technological equipment and processes. Fundamentals of fire prevention at production facilities. Plan 1. General safety requirements for technological equipment and processes. 2. Safety during the operation of pressurized systems and cryogenic equipment. 3. The effect of electric current on the human body. 4. Electrical injuries.	4			[1, 4 , 5-6 , 14,18]

5. Factors influencing the consequences of electric shock. 6. Indicators of explosion and fire hazard properties of materials and substances. 7. Classification of explosive and fire hazardous premises and zones.				
Laboratory work 7 Task 1. Determination of the content of harmful gases and vapors in the air using an express method. Task 2. Research on air dustiness Task 3. Research into the illumination of production premises		8		[10,14,18]
Laboratory work 8 Task 1. Research illumination production premises . Task 2. Providing production facilities with primary fire extinguishing equipment.		8		[1,2,3-6,10,14,18]
Independent work Measures and means of normalizing microclimate parameters. General approach to designing lighting systems. Methods for controlling vibration parameters. Characteristics of fields and radiations . Safety during loading and unloading operations. Basic means and measures for ensuring fire safety of a production facility. Fire alarm system. Fire extinguishing means.			22	[17,19,22]
Total for 2 Module	4	10	40	
Total	10	34	52	

4. TEACHING AND LEARNING METHODS

DRN	Teaching methods (work that will be carried out by the teacher <u>during classroom lessons</u> , consultations)	Number of hours	Teaching methods (what types of learning activities should <u>the student perform independently</u>)	Number of hours
<u>DRN 1.</u> Ensuring an appropriate level of quality and safety during the performance of work.	Problem lectures (questions are raised regarding the material covered by the teacher, but the lecturer answers them himself, to focus students' attention on the main point) Presentations (demonstration of information on the topic of lectures)	2	Practical work (completion of tasks in accordance with methodological instructions) Brainstorming during practical work Individual tasks (independent processing of the information proposed by the teacher)	4 20

<u>DRN 2.</u> Knowledge of the basics of the Legislation of Ukraine on labor protection, the system of management and organization of labor protection at work, issues of organizing labor protection training and investigation of accidents at work, as well as methods of economic analysis of injuries ;	Problem lectures (questions are raised regarding the material covered by the teacher, but the lecturer answers them himself, to focus students' attention on the main point) Presentations (demonstration of information on the topic of lectures)	2	Practical work (completion of tasks in accordance with methodological instructions) Individual tasks (independent processing of the information proposed by the teacher)	6 40
<u>DRN 3.</u> Mastering the basics of industrial sanitation, standardization of industrial sanitation parameters and ensuring proper sanitary and hygienic working conditions, issues of safety and electrical safety of production, as well as the basics of fire safety during work ;	Problem lectures (questions are raised regarding the material covered by the teacher, but the lecturer answers them himself, to focus students' attention on the main point) Presentations (demonstration of information on the topic of lectures)	2	Practical work (completion of tasks in accordance with methodological instructions) Individual tasks (independent processing of the information proposed by the teacher)	6 20
<u>DRN 4</u> Implement technical and organizational measures to organize safe working conditions during production activities .	Presentations (demonstration of information on the topic of lectures)	2	Practical work (completion of tasks in accordance with methodological recommendations) Individual tasks (searching for information to write an essay on the topic of independent work)	4 40

5. EVALUATION BY EDUCATIONAL COMPONENT

5.1.Diagnostic assessment (indicated as needed)

5.2. Summative assessment

5.2.1. To assess the expected learning outcomes, there are

No.	Summative assessment methods	Points / Weight in the overall score	Date of compilation
	Module 1 (35 points)		
1.	Defense of practical works (4 LBs, 3 points each)	<i>12 points / 12%</i>	within 5 days after class
2.	Midterm testing (multiple choice test)	<i>23 points / 23%</i>	Week 7
	Module 2 (35 points)		
3.	Practical work defense (4 LBs, 3 points each)	<i>12 points / 12%</i>	within 5 days after class
4.	Midterm testing (multiple choice test)	<i>23 points / 23%</i>	Week 7
5.	Written exam (open questions)	<i>30 points / 30%</i>	17-18 weeks

5.2.2 Evaluation criteria

Component	Unsatisfactorily	Satisfactorily	Good	Perfectly
	< 0 points	1 point	2 points	3 points
Defense of practical works	Task requirements not met	Most requirements are met, but individual components are missing or insufficiently disclosed, there is no analysis of other approaches to the issue	All task requirements met	Fulfilled all task requirements, demonstrated creativity, thoughtfulness, proposed own solution to the problem
Module 1				
1	Defense of practical works	4 practical works, each is rated with a maximum of 3 points (total 12 points)		within 5 days after class
2	Midterm testing (multiple choice test) for Module 1	23 test questions, each worth 1 point		By week 7
Module 2				
3	Defense of practical works	4 practical works, each is rated with a maximum of 3 points (total 12 points)		within 5 days after class
4	Midterm testing (multiple choice test) for Module 2	23 test questions, each worth 1 point		By week 15
5	Exam	Answer to the ticket question (30 points)		By week 15

5.3. Formative assessment:

To assess current progress in learning and understand areas for further improvement,

N o.	Elements of formative assessment	Date
1	Testing for Modules 1 and 2 (multiple choice test)	During the semester, no later than the 7th and 14th weeks
3	Feedback in the form of oral defense of practical work	During the semester, after each laboratory work, at least once a week
4	Verbal feedback during practical work	Up to 14 weeks

6. LEARNING RESOURCES (LITERATURE)

Methodical literature

1. Occupational safety. Lecture notes for first-year students of the educational programs "Food Technologies" and " Craft Technologies and Gastronomic Innovations" of full-time and part-time forms of obtaining education at the level of higher education "bachelor" . Authors: Ph.D. , Assoc. Prof. Vasylenko O.O. Ph.D. , Assoc. Prof. Khvorost T.V., Senior Lecturer Semernya O.V. Volume 91 pp . (Prof. No. 6 dated 05/12/2025).

2. Occupational safety. Methodological recommendations for the implementation of laboratory and practical work for 1st year students of educational programs "Food Technologies" and " Craft Technologies and Gastronomic Innovations" of full-time and part-time forms of obtaining education at the level of higher education "bachelor" . Authors: Ph.D. , Assoc. Prof. Vasylenko O.O. Ph.D. , Assoc. Prof. Khvorost T.V. , Senior Lecturer . Semernya O.V., Head of the Teaching and Methodological Department . Kindya O.P. Volume 112 pp . (Prof. No. 6 dated 05/12/2025).

3. Occupational safety. Methodological recommendations for performing independent work for 1st year students of educational programs "Food Technologies" and " Craft Technologies and Gastronomic Innovations" of full-time and part-time forms of obtaining education at the level of higher education "bachelor" . Authors: Ph.D. , Associate Professor Vasylenko O.O. Ph.D. , Associate Professor Khvorost T.V., Senior Lecturer Semernya O.V., head of the teaching methodical department . Kindya O.P. Volume 55 pages . (Proceedings No. 6 dated 05/12/2025).

4. Vasylenko O.O. Occupational Safety. Methodological instructions for conducting laboratory work "Research on industrial vibration" for applicants of the first (bachelor's) level of higher education of all specialties of full-time and part-time forms of study. - Sumy: SNAU, 2024. - 20 p.

5. Vasylenko O.O. Organization of training in labor protection. Methodological instructions for conducting practical classes. Sumy: SNAU, 2022. - 20 p.

6. Vasylenko O.O. Determination of the content of harmful gases and vapors in the air by express method . Methodological instructions for conducting laboratory work. - Sumy: SNAU, 2021. - 16 p.

7. Vasylenko O.O. Research of microclimate parameters . Methodological guidelines for conducting laboratory work. – Sumy: SNAU, 2021. – 16 p.

8. Levchenko I.M., Ladyka L.M. Life Safety . Methodological guidelines for conducting practical classes. Part 1. - Sumy: SNAU, 2024. - 49 p.

9. Levchenko I.M., Ladyka L.M. Life Safety . Methodological guidelines for conducting practical classes. Part 2. - Sumy: SNAU, 2022. - 45 p.

10. Levchenko I.M., Ladyka L.M. Life Safety . Methodological guidelines for conducting practical classes. Part 3. - Sumy: SNAU, 2023. - 60 p.

Basic literature

1. Protolyeyskyi O.S. Occupational safety: Practical course for students of all specialties: – Kyiv: NAU, 2022 – 82 p.
2. Pistun I.P. Occupational safety (practicum): Teaching aids / General editor . Ph.D. , Assoc. Prof. I. P. Pistun . – Lviv: “Triada Plus”, 2022 – 436 p.
3. Prisyazhnyuk L.A. Methodical manual on the operation and use of fire extinguishers. /Prisyazhnyuk L.A., Bilkun D.G., Balenko V.K. et al.-K.: Osnova , 2022.-147 p.
4. Bedriy Ya.I., Boyarska V.M., Golubev A.K. and others. Life Safety: A Manual for Students of Technical Universities . L., 2021. – 275 p.
5. Life Safety. Teaching . manual . / Edited by M. Nazaruk . – Lviv: "For a Free Ukraine", 2022 – 275 p.
6. Zaplatinsky V. M. Fundamentals of criminological security of modern business: Textbook for universities. – Kyiv: Kyiv State University of Trade and Economics , 2022. – 141 p.
7. Zaplatinsky V. M. Safety of life: Reference lecture notes. – K.: Kyiv. State . Trade.- Economic . University, 2023. – 207 p.
8. Lapin V. M. Safety of human life. – L.: Lviv Banking College, 2022. – 192 p.
9. Zhelibo E.P., Safety of life. /E. P. Zhelibo , N. M. Zaverukha , V. V. Zatsarny . Ed. Zhelibo E. P.: Textbook . – Lviv, “Novyi Svit-2000”. – 2024. – 320 p.

Additional literature

1. Khursenko , S. M., Semernya , O. V., Khvorost, T. V., & Vasylenko, O. O. (2025). Using European experience in developing preventive measures for occupational safety. Bulletin of the Sumy National Agrarian University. Series: Mechanization and automation of production processes, (4 (58), 89-95. <https://doi.org/10.32782/msnau.2024.4.13>
2. Khvorost, T. V., Khursenko , S. M., Semernya , O. V., & **Vasylenko, O. O.** (2025). The influence of harmful factors of the production environment on the development of occupational diseases of agricultural workers. Bulletin of the Sumy National Agrarian University. Series: Mechanization and automation of production processes, (1 (59), 96-101. <https://doi.org/10.32782/msnau.2025.1.15>
3. Vasylenko O. (2024). Improvement of sugar beetroot storage technology with the development of kagatu ventilation modes . The development of technical , agricultural and applied science as the main factor in improving life –2024. –297p.
4. Vasilenko OO Monitoring and simulation of the environmental state of the sumy region 29th International Scientific Conference "Technologies of the 21st Century", Odessa, (November 20-22, 2023). p.96.
5. Vasilenko OO The influence of the conditions of the production environment on human health and performance 29th international scientific Conferences " Technologies" XXI century ”, Odessa , (November 20-22, 2023) . p.97 .
6. Vasilenko OO Innovative approaches to the field of labor protection in universities 29th international scientific Conferences " Technologies" XXI century ”, Odessa , (November 20-22 , 2023) . p.102 .
7. Vasilenko OO Main hazards of the air environment in the working areas of agricultural enterprises 29 y international scientific Conferences " Technologies" XXI century ”, Odessa , (November 20-22 , 2023) . p. 104 .
8. Vasilenko OO State of fire safety and emergency situations in Sumy region 29th International Scientific Conference "Technologies of the 21st Century", Odessa, (November 20-22, 2023). p. 106.
9. Vasylenko O.O., Ustyk I.V. Improvement of sugar beet storage technology 29th International Scientific Conference "Technologies of the 21st Century", Odessa, (November 20-22, 2023). p. 106.
10. Vasylenko O.O., Yashchenko E.V. Improving the design of a milk separator 29th International Scientific Conference "Technologies of the 21st Century", Odessa, (November 20-22, 2023). p. 106.

Information resources

<https://cdn.snau.edu.ua/moodle/course/view.php?id=1438>

