UNIVERSITY OF PETROȘANI
FACULTY OF MINES

CURRICULUM

(valid starting with the academic year **2026-2027**)

Field: **Industrial Engineering**

Study programme: **Industrial Safety Engineering**

Graduate title: **Engineer**

Duration of studies: **8 semesters**

Form of education: **full-time (IF)**

I. Requirements for obtaining the diploma

240 credits, of which:

- credits for compulsory subjects: **214**
- credits for optional subjects: **26**

4 credits for the subject Physical Education

10 credits for passing the diploma examination

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II. Course of studies (in number of weeks)

Year	Teaching activities		Exam sessions			Holiday		
	Sem. I	Sem. II	I	V	R	Winter	Inter-semester	Summer
Year I	14	14	3	3	2	3	1	12
Year II	14	14	3	3	2	3	1	12
Year III	14	14	3	3	2	3	1	12
Year IV	14	14	3	3	2	3	1	-

III. Number of hours per week

	Sem. I	Sem. II
Year I	28	28
Year II	28	28
Year III	28	28
Year IV	28	28

IV. Diploma examination

Period for the diploma examination: **June-July session, September session**
Content of the diploma examination:

- Test 1: Assessment of fundamental and specialist knowledge - **5 credits**
- Test 2: Presentation and defence of the diploma project - **5 credits**

V. Method of choosing the optional subjects

One subject is chosen from the package of optional subjects for each semester

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INGINERIA SECURITĂȚII ÎN INDUSTRIE

Mission of the Industrial Safety Engineering study programme

The Industrial Safety Engineering study programme has a mission and objectives consistent with the declared mission of the University of Petroșani. The study programme has, on the one hand, a teaching mission, consisting in the professional training of students in the following competences: educational, research, development and professional training, communication, in accordance with the requirements of modern education for training specialists in ensuring the occupational safety and health of workers and the safety of industrial processes and equipment, and, on the other hand, a research mission, consisting in organising and carrying out, under legal conditions, scientific research, technological development, design, consultancy and expertise activities.

Objectives of the Industrial Safety Engineering study programme

Training specialists so that graduates can carry out their professional activity in the field of industrial safety engineering, occupational health and safety, and fundamental or applied research; the flexibility of the curricula enables future engineers to easily move towards other fields as well, so that they can access the labour market easily and quickly. The process of training future specialists is designed to achieve the following objectives:

- developing occupational safety and health management projects by selecting, combining and using concepts, principles, regulations, standards and methods specific to the field;
- appropriate use of standard assessment criteria and methods for prevention activities and for the management of the occupational safety and health system;
- designing and providing technical assistance and operating work systems under safe and healthy conditions;
- integrating safety and health principles into work processes by identifying and assessing occupational risks;
- ensuring the integrated management of occupational safety and health activities in the socio-economic environment;
- performing calculations, demonstrations and applications for solving tasks specific to industrial engineering;
- training specialists open to dialogue and concerned with their civic responsibilities.

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No. crt.	YEAR I / Subject	Subject subject	Subj. type	Semester 1				Semester 2				Credit points		Ei, Ci, Vi		No. of teaching hours per subject			Total individual study hours	Total subject hours
				C	S	L	P	C	S	L	P	Sem.1	Sem.2	Sem.1	Sem.2	Lect.	Appl.	Total		
1	Mathematical Analysis	IDISFO101	F	2	2							5		E1		28	28	56	69	125
2	Linear Algebra, Analytic and Differential Geometry	IDISFO102	F	2	2							5		E1		28	28	56	69	125
3	Chemistry	IDISFO103	F	2		2						4		E1		28	28	56	44	100
4	Applied Computer Science I	IDISFO104	F	2	2	2						5		E1		28	56	84	41	125
5	Technical Drawing and Computer Graphics I	IDISFO105	S	2		2						5		E1		28	42	70	55	125
6	**Optional subject OP 11**	IDISCA106	C	1	2							4		C1		14	28	42	58	100
7	Foreign Language I	IDISCO107	C		2							2		C1		0	28	28	22	50
8	Physical Education and Sport I	IDISCO108	C		1							1		A/R		0	14	14	11	25
9	Probability Theory and Mathematical Statistics	IDISFO109	F					2	2				5		E2	28	28	56	69	125
10	Physics	IDISFO110	F					2		2			5		E2	28	28	56	69	125
11	Materials Science	IDISDO111	S					2		2			5		E2	28	28	56	69	125
12	Mechanics I	IDISDO112	S					2	1				4		E2	28	14	42	58	100
13	Applied Computer Science II	IDISFO113	F					2	2	2			5		E2	28	56	84	41	125
14	Technical Drawing and Computer Graphics II	IDISFO114	S					2		2			4		C2	28	28	56	44	100
15	Foreign Language II	IDISCO115	C						2				2		C2	0	28	28	22	50
16	Physical Education and Sport II	IDISCO116	C						1				1		A/R	0	14	14	11	25
TOTAL year I				11	11	6	0	12	8	8	0	30	30	10E + 6C		322	462	784	766	1550
												60								
17	E-government (elective)	IDISCL117	DFA						2	1			3		C2	28	14	42	33	75

Physical Education and Sport - credits in addition to the total of 60

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No. crt.	YEAR II Subject	Subject subject	Subj. type	Semester 3				Semester 4				Credit points		Ei, Ci, Vi		No. of teaching hours per subject			Total individual study hours subject	Total hours
				C	S	L	P	C	S	L	P	Sem.1	Sem.2	Sem.1	Sem.2	Lect.	Appl.	Total		
18	Strength of Materials	IDISDO218	S	2		2						4		E3		28	28	56	44	100
19	Electrical Engineering	IDISDO219	S	2		2						4		E3		28	28	56	44	100
20	Thermal Engineering and Thermal Equipment	IDISDO220	S	2		1						4		E3		28	14	42	58	100
21	Mechanics II	IDISDO221	S	2	1							4		E3		28	14	42	58	100
22	Materials Technology	IDISDO222	S	2		2						4		C3		28	28	56	44	100
23	Tolerances and Dimensional Control	IDISDO223	S	2		1						4		E3		28	14	42	58	100
24	**Optional subject OP 21**	IDISDA224	S	2		2						4		C3		28	28	56	44	100
25	Foreign Language III	IDISCO225	C		2							2		C3		0	28	28	22	50
26	Physical Education and Sport III	IDISCO226	C		1							1		A/R		0	14	14	11	25
27	Industrial Management	IDISDO227	S					2	2				4		E4	28	28	56	44	100
28	Fluid Mechanics	IDISDO228	S					2		1			3		C4	28	14	42	33	75
29	Machining and Cutting Tools	IDISDO229	S					2		1			3		E4	28	14	42	33	75
30	Ecology and Environmental Protection	IDISDO230	S					2		2			4		E4	28	28	56	44	100
31	Machine Elements	IDISDO231	S					2		2			4		E4	28	28	56	44	100
32	Heat Treatments	IDISDO232	S					2		1			3		C4	28	14	42	33	75
33	**Optional subject OP 22**	IDISDA233	S					2		2			3		E4	28	28	56	19	75
34	Foreign Language IV	IDISCO234	C						2				2		C4	0	28	28	22	50
35	Physical Education and Sport IV	IDISCO235	C						1				1		A/R	0	14	14	11	25
36	Field internship (3 weeks x 30 hours/week)	IDISDO236	S								90		4		C4	0	90	90	10	100
TOTAL year II				14	4	10	0	14	5	9		30	30	10E + 9C		392	392	784	676	1550
												60								
37	Sustainable Development (elective)	IDISCL237	DFA	2	1							3		C3		28	14	42	33	75

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No crt.	YEAR III 38 Industrial Subject	Subject code	Subj. type	Semester 5				Semester 6				Credit points		Ei, Ci, Vi		No. of teaching hours per subject			Total individual study hours subject	Total hours subject
				C	S	L	P	C	S	L	P	Sem.1	Sem.2	Sem.1	Sem.2	Lect.	Appl.	Total		
Ventilation		IDISDO338	S	2		1	1					5		E5		42	28	70	55	125
39	Occupational Safety and Health Legislation	IDISSO339	S	2	2							5		E5		28	28	56	69	125
40	Electrical Safety	IDISSO340	S	2		2						4		C5		28	14	42	58	100
41	Electrical Machines and Drives	IDISDO341	S	2		2						4		E5		28	28	56	44	100
42	General Economics	IDISCO342	C	2	2							4		E5		28	28	56	44	100
43	Elements of Electronics and Automation	IDISDO343	S	2		2						4		E5		28	28	56	44	100
44	**Optional subject OP 31**	IDISDA344	S	2		2						4		C5		28	28	56	44	100
45	Occupational Risk Assessment	IDISSO345	S					2	2				4		E6	28	28	56	44	125
46	Occupational Risk Assessment project	IDISSO346	S								2		2		C6	0	28	28	22	50
47	Machinery Safety	IDISSO347	S					2	2				4		E6	28	28	56	44	100
48	Ergonomics	IDISSO348	S					2	1				3		E6	28	14	42	33	75
49	Tribology	IDISDO349	S					2		1			3		C6	28	14	42	33	75
50	Environmental Risk Assessment	IDISSO350	S					2	2				4		E6	28	28	56	44	100
51	Machine Tools	IDISDO351	S					2		2			3		E6	28	28	56	19	75
52	**Optional subject OP 32**	IDISDA352	S					2		2			3		C6	28	28	56	19	75
53	Specialised internship	IDISSO353	S								90		4		C6	0	90	90	10	100
TOTAL year III				14	4	9	1	14	7	5	2	30	30	10E + 6C		392	392	784	626	1500
												60								
54	Entrepreneurship	IDISCL354	DFA	2	1							4		C5		28	14	42	58	100

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No. crt.	YEAR IV Subject	Subject subject	Subj. type	Semester 7				Semester 8				Credit points		Ei, Ci, Vi		No. of teaching hours per subject			Total individual study hours subject	Total hours
				C	S	L	P	C	S	L	P	Sem.1	Sem.2	Sem.1	Sem.2	Lect.	Appl.	Total		
55	Reliability and Maintenance	IDISSO455	S	2		1						4		E7		28	14	42	58	100
56	Major Failures and Accidents in Industry	IDISSO456	S	2	2							4		E7		28	28	56	44	100
57	Audit and Certification in Industrial Safety Engineering	IDISSO457	S	2	2							5		E7		28	42	70	55	125
58	Audit and Certification in Industrial Safety Engineering	IDISSO458					2							C7		0				
59	Prevention of Occupational Risks	IDISSO459	S	2	1	1						5		E7		28	28	70	55	125
60	Protective Means and Equipment	IDISSO460	S	2		2						4		E7		28	28	56	44	100
61	Geographic Information Systems	IDISSO461	S	2	1							4		C7		28	14	42	58	100
62	**Optional subject OP 41**	IDISSA462	S	2	2							4		C7		28	28	56	44	100
63	Occupational Safety and Health Management	IDISSO463	S					2	2				5		E8	28	28	70	69	125
64	Risk Management	IDISSO464	S					2	1				4		E8	28	14	42	58	100
65	Economic Assessment of Work Accidents and Occupational Diseases	IDISSO465	S					2	1				4		C8	28	14	42	58	100
66	Quality Management	IDISSO466	S					2	1				4		E8	28	14	42	58	100
67	Fundamentals of Occupational Hygiene	IDISSO467	S					2	1				4		E8	28	14	42	58	100
68	**Optional subject OP 42**	IDISSA468	S					2	1				3		E8	28	14	42	33	75
69	Preparation of the diploma project	IDISSO469	S								9		6		C8	0	126	126	24	150
	TOTAL year IV			14	8	4	2	13	8	2	65	30	30	10E + 5C		364	420	784	716	1500
												60								
70	Human Resources Management	IDISDL470	DFA	2	1							3		C7		28	14	42	33	75

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OPTIONAL SUBJECTS				
No.	Subject code	Year of study	Subject names	
6	OP 11	I	Ethics and academic integrity	Managerial Communication
24	OP 21	II	Fundamentals of Surface Generation on Machine Tools	Mechanisms
33	OP 22	II	Fundamentals of Computer-Aided Process Planning	Fundamentals of Industrial Engineering
44	OP 31	III	Mechanical Vibrations	Industrial Design
52	OP 32	III	Technological Fixtures	Finite Element Method
62	OP 41	IV	Emergency Management	Environmental Management
68	OP 42	IV	Labour Legislation	Work Psychology

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DISTRIBUTION OF HOURS BY SUBJECT GROUPS					
Total lecture hours:			1470		
Total application hours:			1666		
Total hours:			3136		
Total lecture hours / Total hours (%) :	1470	/	3136	x 100	46.88
Total application hours / Total hours (%) :	1666	/	3136	x 100	53.13
Total application hours / Total lecture hours	1666	/	1470		1.13

SUBJECT GROUPS	No. hours	No. hours / Total hours (%)
Fundamental subjects DF	448	14.29
Specialist subjects DS	2422	77.23
Complementary subjects DC	266	8.48
Compulsory subjects DOB	2772	88.39
Optional subjects DOP	364	11.61
Elective subjects DFA	168	

REMARKS: Hours of subjects marked with (*) are not counted

For one credit point, 25 teaching and individual study hours are allocated

LEGEND: *Subjects by formative category:* F - fundamental subject, S - specialisation subject, C - complementary subject, *Subjects by optionality:* DOB - compulsory subject, DOP - optional subject (by choice), DFA - elective subject (free) C - lecture, S - seminar, L - laboratory, P - project, Apl - application hours

Ei, Ci, Vi - exam, colloquium, verification respectively in semester i, i =1 ÷ 8

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Basic group from COR/ISCO-08/ESCO representative of the Industrial Safety Engineering study programme

2263 Environmental and occupational health and hygiene professionals

Target occupations from the representative COR/ESCO basic group of the study programme Industrial Safety Engineering

26302 Occupational safety and health specialist
22603 Occupational safety and health coordinator (higher education) 226308 Occupational safety and health coordinator for logistics (higher education)

Competences for the Industrial Safety Engineering study programme

Professional competences

CP1. Advises on risk management

CP2. Performs risk assessment
CP3. Proposes improvements and describes measures to be taken at organisational level
CP4. Complies with standards on the safety of technical equipment
CP5. Communicates safety and health measures
CP6. Monitors legislative developments
CP7. trains workers on occupational risks
CP8. Advises on conflict management
CP9. Uses CAD software
CP10. analyses workplace ergonomics

CP11. Manages emergency evacuation plans
CP12. Tests safety strategies
CP13. Recommends safety improvement measures
CP14. Manages emergency procedures
CP15. Trains on emergency management

CP16. Estimates damage
CP17. Performs risk analysis
CP18. Complies with personal hygiene standards
CP19. Trains employees
CP20. Uses personal protective equipment
CP21. Devises strategies for nuclear or radiological emergencies

Transversal competences

CT1. Thinks analytically
CT2. Applies scientific, technological and engineering knowledge
CT3. Works in teams
CT4. Complies with regulations
CT5. Complies with workplace safety rules

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Learning outcomes for the Industrial Safety Engineering study programme

Knowledge generated by the learning outcomes for the Industrial Safety Engineering study programme

C1. Identifies and describes basic concepts, principles and methods of mathematics, mechanics, industrial processes and materials science relevant to safety and health in industry.
C2. Explains and interprets the phenomena that can generate risks in industrial processes.
C3. Identifies and describes the legislation specific to occupational safety and health and emergency situations.
C4. Explains and interprets the technical documentation, operating procedures, intervention plans and regulations applicable in the field of industrial safety.
C5. Explains the principles of risk management, ergonomics, psychosocial factors and occupational risk assessment methods.
C6. Identifies and describes the functionality of protective equipment and of technological risk detection, alarm and control systems.

Skills generated by the learning outcomes for the Industrial Safety Engineering study programme

A1. Applies risk assessment methods and criteria for identifying, analysing and controlling hazards specific to industrial environments.
A2. Performs measurements, processes data and interprets results on workers' exposure to risk factors.
A3. Proposes technical and organisational solutions for risk reduction, in compliance with legislation, national/international standards and sustainability requirements.
A4. Selects and uses modern tools, equipment and technologies for monitoring occupational safety and health.
A5. Prepares risk assessments, in-house instructions, work procedures, prevention and protection plans and emergency intervention plans.
A6. Evaluates the advantages and limitations of the technical and organisational solutions implemented to control occupational risks.
A7. Applies methods for analysing accidents and incidents, identifying causes and prevention measures.
A8. Uses specific software applications.
A9. Models and simulates technological accident scenarios and emergency situations to substantiate preventive measures.
A10. Integrates ergonomic principles into workplace design, task optimisation and reduction of musculoskeletal risks.

Responsibilities generated by the learning outcomes for the Industrial Safety Engineering study programme

RA1. Documents, describes and manages processes specific to occupational safety and health management and emergency situations.
RA2. Coordinates activities for preventing work accidents and improving working conditions, in collaboration with multidisciplinary teams.
RA3. Develops communication and training skills for instructing workers, presenting risks and implementing a safety culture in organisations.
RA4. Continuously evaluates and updates management systems, ensuring compliance with applicable legislation and standards.
RA5. Plans, organises and monitors internal audit activities in the field of occupational safety and health.
RA6. Takes responsibility for compliance with rules, procedures and good professional practice in the context of activities specific to industrial safety engineering.
RA7. Participates in developing and implementing strategies for preventing technological risks, including for major-hazard installations.

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