

# Transilvania University of Braşov, Romania

## Study program: Occupational Safety and Health Engineering

1<sup>st</sup> Year

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Occupational Security in Industrial Engineering	SMSMII	4	2		1	

**Course description (Syllabus):** Industrial systems engineering; Occupational safety and health; Analyse of the specific labour stresses; Labour place microclimate; Evaluation of the conformity and quality of protection equipment; Impact of the industrial activities on the environment; National and European legislative frame of the dangerous activities control; Occupational safety of metallic materials production.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Modern Control Methods	SMMMCO	5	2		1	

**Course description (Syllabus):** Classification of modern control methods; Non-invasive control methods (visual analysis, penetrating liquids, magnetic powders, ultrasounds, eddy-currents, penetrating radiation control); Invasive control methods (electron microscopy); Methods and instruments for testing biological and chemical agents (spectrometry, gas chromatography); Methods and instruments for water control; Measuring and evaluation of occupational and environmental electromagnetic fields; Methods and equipment for waste materials properties determination.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Quality Management	SMMACA	5	2		1	

**Course description (Syllabus):** Definition of quality. The concept of quality and its evolution; Total quality concept. Principles of total quality. Quality system and total quality. ISO 9000/ ISO 90001; Quality management principle. The definition of concept. Quality management basic principles. Steps towards total quality management; Quality management principles promoted by the new series of ISO9000:2000 standards; Quality management documents. Quality manual. Quality plan. Quality system procedures. Work instructions. Quality registration; Quality audit and certification; Knowledge of the basic instruments used in quality improving.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Calculus Methods and Programs	SMMPRC	5	2		1	

**Course description (Syllabus):** Databases utilization in technologies elaboration. Creation and manipulation of databases. Creating and editing and visualizing of tables. Data import and export. Table correlations. Queries types. Creating and modifying queries. Creation and modification of forms. Controls selecting. Reports creation and functioning. Reports modification. Templates creation. Data inserting and formatting. 3D modelling. The sketch. Creation of simple parts. Parts assembly. Finite elements method. Finite elements method application to mechanical resistance calculus, fluid and heat transfer. Monitoring of occupational security and health systems. Systems for collecting and transmitting data. Computer networks Occupational security and health systems optimization. Optimization methods.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Risk Management	SMMARI	6	1	1	2	

**Course description (Syllabus):** Key concepts of risk management definition; Risk management- ISO 31000/2009 importance; Simplified model of risk management process; Risks identification; Risks appreciation: analysis, evaluation and ranking; Risk tolerance; Risk handling.

Course title	Code	No. of credit	Number of hours per week			
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Occupational Safety and Health Legislation	SMLSSM	5	2	1	1	

**Course description (Syllabus):** Introduction to occupational legislation and other related legislation; Social dialogue (employers, trade unions and employee representatives); The individual employment contract (regulation defining elements, characteristic features, duration, content, form and registration, suspending, modification and termination of the individual employment contract); Salaries. Categories of salaries, salary payment; Work and rest time (working time of persons performing mobile road transport activities, rest time, annual leave, holidays and other days off); Ensuring the occupational safety and health (regulation and safety and health principles, obligations of workers and tasks of trade unions, insurance against professional diseases and occupational accidents, authorities and institutions in the field); The legal liability of employees (disciplinary, financial liability, contravention liability, criminal liability).

Course title	Code	No. of credit	Number of hours per week			
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Occupational Medicine and Hygiene	SMMIMU	12	2	1		

**Course description (Syllabus):** Risks determined by the heavy metals: Zn, Pb, Hg, Cd, Cr, Ni, Mn, As. Risks determined by powders: quartz, asbestos, wood, plastic. Risks determined by corrosive and irritating compounds: organic solvents, pesticides. Risks determined by carcinogenic and mutagenic substances. Risks determined by physical factors: ionizing radiation, noise, UV, visible light, electromagnetic fields, mobile phones, warm and cold climate. Risks determined by very demanding work for musculoskeletal and articulations system: vicious postures and movements, lifting and handling of heavy loads, monotonous and repetitive work; anatomical items; static and dynamic work; musculoskeletal disorders. Psychosocial occupational risks: Occupational conflicts. Stress. Extreme reactions caused by traumatic events. Link between occupational accidents and overloading.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Professional Risks Prevention	SMPRPR	6	2	1	1	

**Course description (Syllabus):** Occupational workplace and health. Professional risks. Labour accidents. Occupational diseases. The economic, financial, legal implications. Exercise, mental fatigue, stress, professional dissatisfaction. Monitoring the health of workers. Serious accidents. Emergencies. First aid. Organization systems for professional risks prevention. Risks prevention planning. Responsibilities, documentation and control. Risks evaluating in the European Union. Evaluation methodologies. Professional risks evaluation organization. Selecting persons responsible for risks evaluation. Information sources. The results of the evaluation registration and evaluation revising. Risk factors due to the executant and specific to the work task and of the production means. Risks identification. Access paths, moving machine parts. Electrical equipment, fires, explosions, chemical substances, noise, vibrations, biological hazards. Office activities. Construction, machining, hot working, woodworking. Food industry. Car repair. Agriculture Professional risks evaluation methods and minimization. Occupational documentation and instructions elaborating.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Occupational Damages and Accidents	SMAVAM	6	2		1	

**Course description (Syllabus):** European and national legal framework on control activities which present industrial accident hazards; The current state of art and evaluation methods applicable to industrial sites; Major risks integrated analysis method; Overall structural analysis of hazards. Major damage and accidents in industrial

processes; The fundamental principles of intervention in case of major damage and accidents generating media applicable to hazardous industrial plants; Damage situations management.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Prevention and Protection in Emergency Situations	SMPPSU	6	2		1	

**Course description (Syllabus):** Protective measures for apartments taken before earthquakes. Protective measures taken during and after earthquakes. Conduct rules during floods, fires, snowing, chemical hazards, discovery of unexploded ordnance. The main aspects of protecting the public. Notification. Warning and alarm of the population in case of emergency/armed conflict.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Methods for Evaluation of Professional Risks	SMMERP	6	2	1	1	

**Course description (Syllabus):** Principles and methods of risk evaluation in the EU. Heinrich method. Methods based on reliability and ergonomically analysis. Risk factors. Classification. Risk factors due to the executant. Specific occupational risk factors. Evaluation methods. INCDPM, AESSM, CNPAS, NORISCO method. Risk generated by occupational equipment evaluation methods. AMDEC and HAZOP method. Minimizing of professional risks. Selection of personnel. Evaluation of professional risks evaluation. Documentation and instructions elaboration methodology related to occupational security.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Methods for Occupational Accidents Prevention	SMMPAM	6	2		1	

**Course description (Syllabus):** European and national legal framework on control and prevention activities in the domain of industrial accident hazards. The current state of art on risk analysis and evaluation methods applicable to industrial sites. Integrated risk analysis method intended for prevention of major accidents. Overall structural analysis of situations generated by major damage and accidents on industrial sites. The fundamental principles of

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Investigation of Occupational Accidents	SMIADM	6	2		1	

## 2<sup>nd</sup> Year

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Fires Prevention	SMPRIN	6	2		1	

**Course description (Syllabus):** General terms regarding the preventing and fighting fires; Fire risk; Resistance, behaviour and fire stability; Fires spreading prevention; Access paths, evacuation and intervention; Technological installations designed for prevention and fighting fires. Equipping buildings with fire prevention means; Rules for preventing and extinguishing fires on construction sites, installations and other arrangements.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Occupational Security and Health Auditing	SMASSM	6	2		1	

**Course description (Syllabus):** The concept of audit in the occupational security and health domain; Auditing through

the framework of occupational security and health of the work equipment; Auto evaluation of occupational security and health at small and medium-sized industrial plants; Implementing of OHAS 18001 system.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Social Responsibility	SMRESO	6	2	1		

**Course description (Syllabus):** The concept of social responsibility and its evolution; The new politics of the European Commission regarding the social responsibility and the action plan; Conduct rules and management standards. ISO 26000 presentation and principles (transparency, compliance with interested parties, responsibility, ethics, human rights respecting).

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Occupational Security and Health	SMMSSM	6	1	1	1	

**Course description (Syllabus):** Management approach to occupational health and safety. Occupational health and safety management system: state of art, examples, guidelines, objectives and national framework

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Occupational protection equipment	SMEPRM	6	2		1	

**Course description (Syllabus):** Intrinsically safe tools and equipment; Collective safety equipment and tools; Individual occupational safety equipment; Integrated occupational protection systems; Intervention and rescue activities organization in the case of industrial plants with high risk of toxic/explosive/flammable gases.

Course title	Code	No. of credits	Number of hours per week			
			course	seminar	laboratory	project
Practice and Scientific Research for Elaboration of the Dissertation	SMACPD	15	160			

**Course description (Syllabus):** Critical review of reference literature; Occupational security monitoring; Occupational accidents evaluation and their fitting according to the legislation; Projecting of occupational protection equipment/systems; Solutions proposal for improving the occupational security and health.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Elaboration of the Dissertation Thesis	SMEXDI	15	64			

**Course description (Syllabus):** Critical review of reference literature; Occupational security monitoring; Occupational accidents evaluation and their fitting according to the legislation; Projecting of occupational protection equipment/systems; Solutions proposal for improving the occupational security and health.

Course title	Code	No. of credit	Number of hours per week			
			course	seminar	laboratory	project
Certification of Technical and Individual Safety Equipment	SMCETI	6	2		1	

**Course description (Syllabus):** Intrinsically safe tools and equipment; Collective safety equipment and tools; Individual occupational safety equipment; Safety compliance and quality evaluation of occupational equipment and of individual protection equipment; Compliance of individual protection equipment with the essential security requirements