

Transilvania University of Braşov, Romania

Study program: Integrated Environmental Management

Curriculum for ERASMUS + students

Faculty: Product Design and Environment

Study period: 2 years (master)

Courses description per years (C= course; S = seminar; L = laboratory; P = project)

1st Year

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Environmental policies and strategies	01.01	Romanian	6	2	1		1

Course description (Syllabus): acquiring knowledge to identify and understand environmental strategies and policies, at EU and national level, in order to implement them at the level of organizations; acquiring the ability to identify environmental legislation and corroborate it with environmental policy and the ability to qualify, interpret and corroborate the various normative legal acts and the field of environmental protection.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Environmental protection in sustainable development context	01.02	Romanian	5	2	2		

Course description (Syllabus): The course aim is to identify and thoroughly understand the conceptual and strategic framework for sustainable development on european and national level, emphasizing its environmental protection component. The main topics addressed in the course are: General aspects, history, speciality dictionary related to sustainable development; Economic, social and environmental components of sustainable development: synergies, interdependencies; Environmental protection - basic component of sustainable development - control and reduction of air, water and soil pollution; European perspectives on sustainable development; Implementation of sustainable development in Romania; National Strategy for Sustainable Development of Romania Horizons 2013-2020-2030; Romania's medium and long-term strategic objectives regarding sustainable development (Horizon 2020. Targets 2030); Strategic objectives for the sustainable development of Romania.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Toxic and hazardous substances and wastes	01.03	Romanian	5	2	1	1	

Course description (Syllabus): The course provides a study of different classes of toxic and hazardous substances - sources, physico-chemical and biological properties, method of analysis and environmental impact. Topics include: Toxic and hazardous substances and waste – definitions, classification, sources, evolution and current trends in the field of substances and toxic and hazardous waste; Types of toxic and hazardous substances and waste – Chemicals (corrosive substances, flammable substances, pesticides) and biological waste (household waste, food industry waste, medical waste); Radioactive waste; Military waste; Storage and/or neutralization of toxic and hazardous waste; Legislations and regulations for the toxic and hazardous substances and waste.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Solid waste management	01.04	Romanian	6	2		1	1

Course description (Syllabus): The course provides a detailed understanding of issues related to solid waste and offers tools and approaches to manage these resources in a sustainable and responsible manner. Topics studied in the course include: generating solid waste, identifying primary sources and types of waste, collection systems, transportation,

storage, highlighting associated technologies, and logistics. Different types of waste are discussed: municipal waste, used tires, plastics, end-of-life vehicles, batteries and accumulators, construction and demolition waste.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Ethics and academic integrity	01.05	Romanian	4	1	1		

Course description (Syllabus): Brief history of the concept; Ethical attitude and behaviour in the academic environment; Ethic issues in academic research: academic writing; documentation; the structure of a scientific work; citation rules; Violation of the norms of ethical conduct in the academic space. The plagiarism. Forms of plagiarism; Elements of ethics in organizations: work ethics; honesty; loyalty. Elements of environmental ethics.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Management of sustainable use of water resources	01.06	Romanian	6	2		1	1

Course description (Syllabus): This is a one semester course that provides information about integrated water resource management (IWRM) systems and what the challenges of implementing such a system are. The course focuses on the three sustainability pillars (environmental, economic and social) with respect to water management. It covers aspects of transboundary water basins' management and best practices at a global level. The course also covers the main national and international legislation concerning sustainable water management, as well as the key stakeholders in the implementation and evaluation of IWRM plan. Finally, the course looks at different ways to mitigate climate change effects on water resources.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Integrated technologies for wastewater treatment and soil decontamination	01.07	Romanian	6	2		1	1

Course description (Syllabus): This course focuses on advanced environmental engineering concepts, methods, and technologies for improving water and soil quality. It emphasizes the development of competencies in selecting appropriate depollution techniques. The course content includes: integrated systems approach, principles of treatment processes, wastewater treatment, advanced oxidation processes, membrane processes, biological treatment processes, sludge processing, wastewater reuse, toxicity assessment, soil decontamination.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Air quality management	01.08	Romanian	5	2	1		1

Course description (Syllabus): This course aims to acquire the necessary tools for air quality control and management. The main topics included in the course content are: Air quality concepts related to contamination sources, atmospheric pollutants, the effects of air pollution on the population and the environment; Factors influencing air quality: meteorological and topographical factors; Air quality index; Air quality control; Quantification of air pollutant emissions: technical specifications, inventory types, techniques used to calculate pollutant emissions; Air pollutants dispersion models; Factors which influence the pollutants; Pollutant concentration calculation; Dispersion of dust particles in the air; Air quality monitoring; Pollutant emissions reduction (SO₂, NO_x, VOC, PM) from the air; Effective practices applied in air quality management; Air quality management programs/plans (case studies).

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Environmental risk assessment on health	01.09	Romanian	4	1	1		

Course description (Syllabus): During the semester, the students will be able to identify specific environmental problems, sources of pollution and the impact of pollutants on human health. There will be presented modern methods for

evaluating the quality of the environment and its impact on health. Quantitative and qualitative analysis and interpretation of data and information about environmental strategies and policies for better decisions and actions for health will be discussed.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Environmental impact assessment	01.10	Romanian	5	2	2		

Course description (Syllabus): This optional course consists in the application of specific knowledge for the development of studies to prevent and reduce the impact of pollution on the environment and human health. The course content includes subjects related to: National and European institutions involved in environmental impact assessment; National and European Union legislation regarding environmental impact assessment; Integrated environmental impact assessment; National and European institutions involved in environmental quality monitoring; National and European Union legislation regarding the quality of environmental factors (air, water and soil); Environmental quality monitoring (air, water and soil); Standard methods for sampling and analysis of toxic compounds present in air, water and soil.

2nd Year

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Environmental management systems, environmental quality and occupational safety integration	02.01	Romanian	7	2	1		1

Course description (Syllabus): The course provides the necessary tools and knowledge to implement, maintain and improve integrated environmental, quality and occupational safety systems within organizations. The course begins with an introduction to environmental, quality, and occupational safety concepts and an analysis of relevant legislation and regulations. The course continues with a detailed study of the Environmental Management Systems according to the ISO 14001:2015 standard, highlighting its structure and requirements. The course then moves to ISO 9001:2015 based Quality Management Systems and ISO 45001:2018 Occupational Health and Safety Management Systems (OHSMS). A crucial course component is devoted to integrating these systems, exploring practical approaches and the associated benefits.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Environmental performance assessment	02.02	Romanian	6	2	2		

Course description (Syllabus): ISO 14031 standard - General presentation; Concepts and terminology in the environmental performance evaluation process; Indicators that characterize the water/ air/ soil environmental factors; Indicators for assessing biodiversity; Indicators for population health; Indicators regarding waste management; Tools for the integrated approach to environmental impact; Tools for evaluating sustainable development at different levels of the socio-economic system; Indicators for assessing urban sustainability.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Products life cycle assessment	02.03	Romanian	7	2	1		1

Course description (Syllabus): The course aims to enhance students' competencies in addressing the complete life cycle assessment, from conception and design to use, disassembly, and recycling. It emphasizes a multidisciplinary perspective, integrating technological and engineering knowledge in environmental engineering. Key areas of focus include (i) Analyzing production and consumption processes from a life cycle assessment perspective, identifying main environmental impacts, (ii) Applying technological concepts in modelling and evaluating product life cycles, (iii) Interpreting LCA results to identify potential ecological performance improvements, (iv) Understanding the integration of environmental strategies and policies in the life cycle assessment process.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
BAT models for industrial pollution control	02.04	Romanian	6	2	1		1

Course description (Syllabus): This optional course provides a study of the best available techniques (BAT) for pollution prevention and reduction, respectively for minimizing the environmental impact of the activities from different industrial sectors. Topics studied in this course include: Definitions and general concepts; Presentation and analysis of the DIRECTIVE 2010/75/EU of the European Parliament and of the Council on Industrial Emissions (Directive IPPC - Integrated Pollution Prevention and Control); Criteria for determining best available techniques (BAT); The challenges in selecting BAT for a given industrial sector; BAT reference documents and BAT conclusions for different sectors: Food, Drink and Milk Industries, Production of Cement, Lime and Magnesium Oxide Industry; Pulp and Paper Industry; Common Waste Water and Waste Gas Treatment/Management Systems in the Chemical sector; Textile Industry Waste treatment; Waste incineration; Large combustion plants.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Integrated environmental management system audit	02.05	Romanian	6	2	1		1

Course description (Syllabus): knowledge and understanding of the principles, concepts, procedures and mechanisms specific to carrying out an audit of the integrated environmental management system; the ability to identify and corroborate the different audit standards contained in the integrated system, with environmental legislation.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Management and sustainable development in organizations	02.06	Romanian	4	1	1		

Course description (Syllabus): This course is intended to provide knowledge about Organizations, Management and Sustainable Development. Topics studied in this course include: Basic concepts regarding the Organisations and Management; Sustainable Development; Monitoring Sustainable Development; Sustainable Development Management; Corporate Social Responsibility (CSR) and Sustainable Development; Sustainable development and Environmental Management.

Course title	Code	Language of instruction	No. of credits	Number hours/week			
				C	S	L	P
Projects management	02.07	Romanian	4	1			1

Course description (Syllabus): Project Management is a specialized field that combines project management principles with environmental science. This course typically covers the planning, executing, and monitoring of projects aimed at improving environmental quality or addressing environmental issues. It includes aspects like sustainable development, compliance with environmental regulations, risk assessment, stakeholder engagement, and resource management. Students learn to effectively manage projects that significantly impact the environment, balancing ecological considerations with project goals, budget, and timelines. This discipline is crucial for professionals seeking to lead initiatives in pollution control, renewable energy, conservation, and environmental restoration.