SZKOŁA GŁÓWNA GOSPODARSTWA WIEJSKIEGO

Study programme

Environmental Protection

Faculty:	Faculty of Civil and Environmental Engineering
Level of study:	second cycle (post bachelor's degree)
Education profile:	General academic
Form of study:	full-time studies
Academic year:	2023/24

Table of contents

Basic information

Faculty name:	Faculty of Civil and Environmental Engineering
Major name:	Environmental Protection
Level of study:	second cycle (post bachelor's degree)
Profile of study:	General academic
Form of study:	full-time studies
Duration of studies (number of semesters):	3
Number of ECTS required to complete the studies:	90
The number of ECTS points a student obtains during classes conducted with the direct participation of academic teachers or other persons conducting classes:	53
Professional title awarded to graduates:	magister
ISCED code:	0521
Language of study:	english

Assigning the major to the fields and disciplines to which the learning outcomes relate

Environmental engineering, mining and energy	100%

Major characteristics

Major characteristics

The Environmental Protection MSc program enables all second-degree students to acquire knowledge, skills, and social competences necessary for professional work in environmental protection, in the areas of identifying environmental hazards, collecting and analyzing environmental data, making environmental decisions, applying environmental protection techniques and technologies, as well as the position of environmental protection issues in the legal system of Poland and the European Union.

Learning objectives

The educational goals of the Environmental Protection program align with the mission and strategy of the Warsaw University of Life Sciences - SGGW. The University's values, such as professionalism, quality assurance, diligence, and innovation, form the basis of its identity and successes. The primary objective of the University is to conduct research and implementation activities at the highest level and to prepare future graduates to meet the demands of the modern job market and economy, as well as to function in a knowledge-based society.

Education concept

The concept of education in the Environmental Protection program assumes that the learning outcomes achieved during the program will enable the preparation of a professional workforce with the competencies required for the field, taking into account the requirements of the Polish Qualifications Framework in the field of technical sciences. In addition, the concept takes into account the needs of the economy and the requirements of the job market by maintaining constant cooperation with external stakeholders in improving and changing the educational content and research activities. The education concept aims to create a student-friendly program that provides full satisfaction in learning and creates conditions for student participation in the cultural and scientific life of the academic community.

Description of work placement (if provided for in the study programme)

Graduate profile

Upon completing the second-degree studies in Environmental Protection, a graduate obtains a professional title of a Master. The graduate has an extended knowledge and skills in the functioning mechanisms of the natural environment, the nature of human activities' impact on the environment, and the principles of scientific assessment of their effects. The graduate can independently plan research using modern measurement, analytical, simulation, and experimental methods, understands the principles of environmental protection technologies' operation, as well as legal regulations and administrative procedures used in environmental protection. The graduate is prepared to work in state and local administration bodies dealing with environmental protection, as well as in industrial and service enterprises and consulting firms. The acquired knowledge and skills provide a basis for starting one's own business within companies offering consulting services in the field of environmental protection and remediation technologies for degraded areas.

Learning outcomes

Knowledge

Code	Content	PRK
EP_K2_W01	The graduate knows and understands, to an expanded extent, the issues in mathematics and statistics used for the assessment and interpretation of phenomena and processes occurring in the environment	P7S_WG
EP_K2_W02	The graduate knows and understands, in an expanded scope, the issues related to information technology tools and modeling of processes occurring in the environment	P7S_WG
EP_K2_W03	The graduate knows and understands in depth the analysis of environmental risk and the flow of pollution in the environment	P7S_WG
EP_K2_W04	The graduate knows and understands in an extended scope the issues related to environmental biology, biotechnology, ecology, and ecotoxicology necessary to understand the functioning of aquatic and terrestrial ecosystems and the processes occurring within them	P7S_WG
EP_K2_W05	The graduate knows and understands to an extended extent the issues of planning and methodology of research work, presentation of research results and public communication in the problem area of environmental protection	P7S_WG
EP_K2_W06	The graduate knows and understands in an expanded scope environmental, social and legal conditions determining the use of natural resources and the functioning and development of urban and rural areas, taking into account engineering activities	P7S_WK
EP_K2_W07	The graduate knows and understands the principles of spatial planning and has an in-depth knowledge of environmental policy, air protection, community development strategies, environmental management systems, funding of environmental research and investment and environmental education	P7S_WK
EP_K2_W08	The graduate knows and understands the principles of copyright protection, industrial property protection, patent law, occupational health and safety, and ergonomics	P7S_WK
EP_K2_W09	The graduate knows and understands the principles of creating and developing individual entrepreneurship forms	P7S_WK

Skills

Code	Content	PRK
EP_K2_U01	The graduate is able to analyze complex environmental processes explaining their functioning in a cause-and-effect relationship system using statistical methods and IT tools	P7S_UW
EP_K2_U02	The graduate is able to plan and carry out practical and research tasks in the field of environmental protection using various sources of information as well as analytical, simulation, and empirical methods	P7S_UW
EP_K2_U03	The graduate is able to make environmental decisions based on various sources of information using legal, economic and decision support tools	P7S_UW
EP_K2_U04	The graduate is able to analyze the factors affecting the state of the environment and human health, as well as conduct a risk analysis and assess different types of risks related to the state of the environment	P7S_UW

Code	Content	PRK
EP_K2_U05	The graduate is able to establish the state of the art of the planned research issue on the basis of the literature in Polish and English, making critical use of various sources and relevant information technologies	P7S_UW
EP_K2_U06	The graduate is able to describe and present their own completed research project in the form of a scientific paper with an abstract in English (at the B2+ level of the Common European Framework of Reference for Languages)	P7S_UK
EP_K2_U07	The graduate is able to formulate professional opinions on environmental protection issues, combining knowledge from various subjects, analyzing the pros and cons of different options, and evaluating the potential of new techniques and technologies in solving engineering problems	P7S_UK
EP_K2_U08	The graduate is able to plan their own development and organize individual and teamwork effectively	P7S_UO
EP_K2_U09	The graduate is able to critically analyse existing technical solutions for environmental protection and propose their improvements	P7S_UU

Social competence

Code	Content	PRK
EP_K2_K01	The graduate is ready to take responsibility for decisions related to the state of the environment and the quality of life, guided by the principle of anticipating consequences and reducing risks	P7S_KK
EP_K2_K02	The graduate is ready to cooperate and lead a team with a sense of responsibility for safe implementation of the assigned task	P7S_KK
EP_K2_K03	The graduate is ready to identify environmental hazards, set priorities for actions, and responsibly carry out tasks	P7S_KK
EP_K2_K04	The graduate is ready for systematic interdisciplinary updating of knowledge in the field of environmental protection by using various sources and has a desire to inspire other people in this regard	P7S_KK
EP_K2_K05	The graduate is ready to lead a social debate on environmental education	P7S_KO
EP_K2_K06	The graduate is ready to search for practical applications and analyze their implementation possibilities within business activity	P7S_KO
EP_K2_K07	The graduate is ready to adhere to professional ethics, copyright laws, and industrial property protection laws. They have an awareness of the importance of professional responsibility, and strive to develop their professional skills and contribute to the traditions of their field	P7S_KR

Study plan

Semester 1

In semester 1, students complete library training and a health and safety course on a platform available at https://szkolenia.sggw.pl

Subject	Number of hours	ECTS points	Form of verification	
OHS training	OHS training: 4	0	Pass	O
Methodology of Environmental Research	Lecture: 15 Auditorium exercises: 30	3	Pass with grade	O
Intellectual Property Protection	Lecture: 10	1	Pass with grade	O
Strategy and policy in environmental conservation	Lecture: 30	2	Pass with grade	O
Ecotoxycology	Lecture: 15 Laboratory exercises: 30	4	Exam	O
Landscape ecology	Lecture: 30	2	Pass with grade	O
GIS modeling	Lecture: 15 Auditorium exercises: 30	3	Pass with grade	O
Environmental processes modelling	Lecture: 15 Project exercises: 30	3	Exam	O
Humanities and social sciences faculty I	Lecture: 30	2	Pass with grade	G
Food in culture and society	Lecture: 30	2	Pass with grade	F
Social capital and civil society	Lecture: 30	2	Pass with grade	F
Outdoor activity and the protected areas	Lecture: 30	2	Pass with grade	F
Foreign language/elective	Auditorium exercises: 30	2	Pass with grade	G
Foreign language/elective	Auditorium exercises: 30	2	Pass with grade	F
Restoration and Management of Environment	Lecture: 60 Project exercises: 60	8	Pass with grade	G
Bioremediation	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Soil hazard pollution and protection	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Case study of environmental protection	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Contemporary challenges in wetlands restoration	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Ecological infrastructure in agriculture landscapes	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Sum	**434**	**30**		

Semester 2

Subject	Number of hours	ECTS points	Form of verification	
Contaminant flow in the environment	Lecture: 15 Laboratory exercises: 30	3	Pass with grade	O
Environmental conservation and landscape planning	Lecture: 30	2	Pass with grade	O
Decision support systems in environmental conservation	Lecture: 15 Auditorium exercises: 15 Project exercises: 15	4	Exam	O
Environmental resources valuation	Lecture: 15 Project exercises: 15	2	Pass with grade	O
Riparian ecosystems conservation	Lecture: 15 Project exercises: 30	3	Pass with grade	O
Noise protection	Lecture: 15 Project exercises: 15	2	Pass with grade	O
Diploma seminar I of specialization Restoration and Management of Environment	Auditorium exercises: 15	2	Pass with grade	O
Restoration and Management of Environment	Lecture: 60 Project exercises: 60	8	Pass with grade	G
Environmental Stress and Plants	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Phytoremediation of air pollution	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Climate change and environment	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Nature based solutions	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Ecological base of nature conservation	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Databases and programming	Lecture: 15 Project exercises: 15	2	Pass with grade	F
Foreign language/elective	Auditorium exercises: 30	2	Pass with grade	G
Foreign language/elective	Auditorium exercises: 30	2	Pass with grade	F
Mathematical statistics	Lecture: 15 Project exercises: 15	2	Pass with grade	O
Sum	**420**	**30**		

Semester 3

Subject	Number of hours	ECTS points	Form of verification	
Risk Analysis	Lecture: 15 Auditorium exercises: 9 Project exercises: 6	2	Pass with grade	O
Diploma seminar II of specialization Restoration and Management of Environment	Auditorium exercises: 15	2	Pass with grade	O
Restoration and Management of Environment	Lecture: 30 Project exercises: 60	6	Pass with grade	G
Ecological engineering for environmental protection	Lecture: 15 Project exercises: 30	3	Pass with grade	F
Hydrogenic soils	Lecture: 15 Project exercises: 30	3	Pass with grade	F
Land and water conservation	Lecture: 15 Project exercises: 30	3	Pass with grade	F
Praca dyplomowa	Diploma thesis: 0	20	Exam	G
Praca dyplomowa	Diploma thesis: 0	20	Exam	F
Sum	**135**	**30**		

O - Obligatory subjects
G - Mandatory group
F - Elective subjects

Subject name:		Methodology of Environmental Research	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	procedures for collecting data for specific needs.	EP_K2_W01
	W2	The student is familiar with appropriate statistical analyses.	EP_K2_W01
Skills: (In terms of skills, the graduate can)	U1	systematically collect data from databases and the field.	EP_K2_U01
	U2	perform statistical analyses commonly used in environmental research.	EP_K2_U02
Social competences: (Within the scope of competence, the graduate is ready to)	K1	acquire and collect data from databases and the field.	EP_K2_K02
	K2	present statistical data, critically evaluate them, and draw conclusions about their validity.	EP_K2_K02
Course content ensuring the achievement of learning outcomes:		Presentation of selected procedures for collecting environmental data. Overview of methods used in monitoring the state of the environment, researching the state of species, natural habitats, and landscapes. Basics of formulating research hypotheses and ways of verifying them with selected examples. Theoretical preparation for solving the assigned research problem in the field of environmental protection, leading to its practical solution during exercises. Collecting relevant data in the field and compiling them. Processing the data using statistical methods. Critical analysis of the obtained results. Collecting literature data to enable a critical assessment of the obtained results. Adopting a public stance on the research hypotheses formulated.	
Examination methods:		Presentation, Project	

Subject name:		Intellectual Property Protection	ECTS: 1
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	the essence and role of intellectual property management and the principles of organizing intellectual property protection in the enterprise	EP_K2_W08
Skills: (In terms of skills, the graduate can)	U1	independently expand knowledge in the field of management intellectual property	EP_K2_U08
Social competences: (Within the scope of competence, the graduate is ready to)	K1	conscious use and management of intellectual property in the enterprise, bearing in mind the importance of social, ethical and professional responsibility for non-compliance with the law in the field of intellectual property protection	EP_K2_K07
Course content ensuring the achievement of learning outcomes:		Strategies for managing intellectual property. Trade secrets. International intellectual property protection. Protection of domain names. Protection of databases. Collective management organizations for copyright or related rights.	
Examination methods:		Test (written or computer based), Assignment	

Subject name:		Strategy and policy in environmental conservation	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	reasons for which it is necessary to include environmental protection objectives - both by public entities and enterprises - in coherent environmental strategies and policies, understands the importance of these documents for engineering activities and investments for environmental protection, knows the tools used in the practice of environmental protection	EP_K2_W06, EP_K2_W07
	W2	They have in-depth knowledge of the organizational and legal conditions of creating and implementing policies and strategies in environmental protection at various levels and in relation to various entities and environmental conditions of socio-economic development, understand the risk of ignoring the objectives of environmental strategies when making economic and social decisions	EP_K2_W03, EP_K2_W07
Skills: (In terms of skills, the graduate can)	U1	use his knowledge and available sources of information to make environmental decisions, taking into account the needs of socio-economic development within the limits of the available ecological space	EP_K2_U03, EP_K2_U07
	U2	predict the environmental, social and economic effects caused by the lack of consideration of environmental protection objectives in the process of making social and economic decisions both at the level of business entities and public	EP_K2_U04, EP_K2_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	make decisions that take into account the need to maintain the stability of the natural system and not to violate the available ecological space	EP_K2_K03, EP_K2_K06
Course content ensuring the achievement of learning outcomes:		Characteristics of environmental protection policy and pro-ecological strategies - similarities and differences. Evolution of the place of environmental protection policy in the activities of public authorities in economic activity: from inaction, through "end of the pipe" solutions, the concept of sustainable development to the need to take into account planetary boundaries and the need for stability of the natural system. Legal basis for creating policies and strategies in environmental protection at the enterprise level, public entities (local governments, state environmental policy) as well as at the EU and global level. National ecological policy, and environmental protection strategies at the European Union and global level. National and EU legislative procedure as a tool supporting the achievement of environmental policy objectives. EU law as an element of national environmental protection procedures. International environmental law and procedures for incorporating international law norms into national legislation. Legal norms and legal system as the basis of administrative and legal procedures in environmental protection. Systemic foundations of environmental protection law, legal principles. The concept of an administrative procedure, and the course of this procedure as an element of environmental protection management. An administrative decision as an element determining administrative proceedings and a form of creating a new legal order for the addressee. The institutional system as an emanation of the goals and role of the state's ecological policy in the general policy of public authority. Administrative authorities of environmental protection in Poland. Policies and strategies in the protection of the environment of enterprises - legal obligations and their role in building a competitive advantage on the international market. Place of environmental protection strategy in management systems, e.g. IS 140000, ISO 26OOO. Environmental reporting as an important tool of companies' environmental strategy. The role of society in the implementation of environmental policy objectives, innovative tools of this policy.	
Examination methods:		Written credit	

Subject name:		Ecotoxycology	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	basic concepts and ecotoxicological terminology	EP_K2_W01, EP_K2_W04
	W2	basic ecotoxicological phenomena and processes occurring in the environment	EP_K2_W02
	W3	basic techniques and research tools used in ecotoxicology	EP_K2_W05
Skills: (In terms of skills, the graduate can)	U1	make correct conclusions based on data from various sources	EP_K2_U01, EP_K2_U02
	U2	prepare a well-documented study of problems in the field of ecotoxicology	EP_K2_U04, EP_K2_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	work individually and, in a team	EP_K2_K02
	K2	the dangers of the release of toxic substances into the environment and responsibility for the state of environment.	EP_K2_K01, EP_K2_K03
Course content ensuring the achievement of learning outcomes:		Lectures: Scope of ecotoxicology, terms and concepts. Standard procedures in ecotoxicological analyses. Examples of using ecotoxicological analyzes in environmental research. Research methods used in ecotoxicology, laboratory tests, ecotoxicological tests, long and short term bioassessments. Planning experiments using ecotoxicological tools. Tests used to determine the degree of toxicity of soil, bottom sediments and air. Water toxicity tests. Classification of xenobiotics and environmental factor affecting the toxicity of the substance. Inorganic toxic substances: heavy metals, gases, dusts, detergents, nitrogen fertilizers. Toxic organic compounds: pesticides, PAHs, dioxins, furans, PCBs, etc. Bioaccumulation and biomagnification of poisons in the trophic chain. Elements of environmental biomonitoring. Applied ecotoxicology. Environmental risk assessment. Environmental impact assessment. Classes: Determination of acute toxicity of selected toxic substances according to the Behrens, Kräber and Thompson methods by calculating the medial lethal dose (LD50) for selected substances along with the evaluation and interpretation of the results. Evaluation of the degree of environmental contamination based on ecotoxicological analysis of heavy metals contained in sewage sludge. Assessment of the long-term effects of chemical substances on the environment (determination of the ecotoxicity of plant protection products on nitrogen transformations in the soil environment). Determination and evaluation of methods of ecotoxicological diagnosis of water reservoirs based on experimental data. Testing the toxicity of pesticides present in soils against monocotyledonous and dicotyledonous plants. Testing the toxicity of pharmaceuticals present in the environment towards higher plants. Determination of the potential ecological risk caused by toxic substances (proper formulation of the problem and determination of priorities for action).	
Examination methods:		Written exam, Report, Test (written or computer based)	

Subject name:		Landscape ecology	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	The basic concepts in the field of landscape ecology.	EP_K2_W02
	W2	The relationships between landscape structure and ecosystem functioning	EP_K2_W07
Skills: (In terms of skills, the graduate can)	U1	Assessing the impacts of human activities on the functioning of landscape ecological systems.	EP_K2_U04
	U2	Proposing methods for sustainable management in ecological landscapes.	EP_K2_U02, EP_K2_U03
	U3	Strengthened capacity to address environmental challenges related to landscape management and conservation.	EP_K2_U02, EP_K2_U03
Social competences: (Within the scope of competence, the graduate is ready to)	K1	Increased awareness of the significance of landscape ecology in maintaining biodiversity and ecosystem services for human health and well-being	EP_K2_K01, EP_K2_K05
Course content ensuring the achievement of learning outcomes:		The concept of landscape in geography, ecology, and common understanding. The role of landscape ecology in natural sciences. Classification of landscape types based on the extent of anthropogenic transformations. Utilizing biotic indicators to characterize landscape structure. Patch and corridor models. Energy dynamics in landscapes. Landscape resilience and diversification. Landscape fragmentation and its implications within the context of island biogeography theory and metapopulation theory. Functioning of landscape populations. Ecotones as transitional zones between ecosystems and their significance in landscape dynamics. Diverse ecosystems around the world – exploring their dynamics and functioning at the landscape scale in the context of landscape ecology. Organisms' reactions to human-caused changes in the landscape. Impacts of human settlement and urbanization on wildlife within the field of landscape ecology. Urban and agricultural landscapes: Understanding the dynamics and impacts on the environment. The significance of sustainable land management for environmental conservation and the preservation of biodiversity. Conservation methods for ecological landscapes – protective measures, large-scale conservation systems, international agreements (such as Natura 2000 areas), and the role of networks in landscape ecology.	
Examination methods:		Written credit	

Subject name:		GIS modeling	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	theory of advanced GIS analyses in tool for authomatic modeling.	EP_K2_W02
	W2	about spatial modeling teqniquest in GIS and scripting and using in R - Studio	EP_K2_W02
Skills: (In terms of skills, the graduate can)	U1	authomatic analysis in QGIS using Spatial Modeler	EP_K2_U01, EP_K2_U02
	U2	adopt simple script in R-Studio for practical use in environmental analysis	EP_K2_U01, EP_K2_U02
Social competences: (Within the scope of competence, the graduate is ready to)	K1	use of internet platforms for programmers (e.g. https://github.com/, https://stackoverflow.com/) to get help and share their solutions.	EP_K2_K02
Course content ensuring the achievement of learning outcomes:		Basic knowledge about raster modeling in chosen software for determine specific environmental protection case studies. GIS as a tool for following and programming of environmental processes.Exercises in chosen software about: data structures , loading and saving data, basic data visualization using chosen packages, loops, conditional instructions and writing functions, work on character data, advanced data visualization, introduction to spatial data analysis, introduction to statistical analyses.	
Examination methods:		Test (written or computer based), Report	

Subject name:		Environmental processes modelling	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	possibilities and limitations of a systematic analysis of the usefulness of computer models suitable for their applications in the study of selected environmental processes.	EP_K2_W01
Skills: (In terms of skills, the graduate can)	U1	carry out analyzes of the mathematical description of environmental processes and their components	EP_K2_U02
	U2	identify, develop and analyze data for the needs of the model as well as correctly analyze and interpret the results of calculations	EP_K2_U01
Social competences: (Within the scope of competence, the graduate is ready to)	K1	team work	EP_K2_K05
Course content ensuring the achievement of learning outcomes:		Modeling environmental processes and the use of numerical models for research, description, and forecasting of these processes in various time and space ranges. Classification of models, and the rules for selecting, identifying, and verifying models. General issues concerning numerical methods and schemes, determinants of numerical tasks, algorithm construction, etc. as well as types and sources of errors in numerical calculations. The issues of modeling environmental processes include, among others. The issues of the description of mechanisms and models of water erosion processes of soils on the slope and in the catchment area, description of sediment discharge from the catchment, instantaneous unit sedimentogram (IUSG), and flood sedimentogram. The most important models and formulas describing sediment transport (lifted and dragged) in rivers, as well as mechanisms and models of sedimentation processes in water reservoirs, are discussed. The issues of water movement in the soil-plant-atmosphere continuum and the exchange of heat energy in the soil are also discussed. Issues related to evapotranspiration and mathematical description of the source term representing water uptake by plant roots are presented in detail. Numerical solutions of the soil water flow equation and models of water flow in the soil-plant-atmosphere system.	
Examination methods:		Written exam, Project	

Subject name:		Food in culture and society	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	Has advanced knowledge of the environmental, social and legal conditions determining the use of natural resources and the functioning and development of urban and rural areas, taking into account engineering activities	EP_K2_W06
Skills: (In terms of skills, the graduate can)	U1	describe and present their own completed research project in the form of a scientific paper with an abstract in English (at the B2+ level of the Common European Framework of Reference for Languages)	EP_K2_U06
Social competences: (Within the scope of competence, the graduate is ready to)	K1	systematic interdisciplinary updating of knowledge in the field of environmental protection by using various sources and has a desire to inspire other people in this regard	EP_K2_K04
Course content ensuring the achievement of learning outcomes:		Food and social organisation – „ How Food Made History";Symbolic value of food. Food in religion. Food taboos and their social functions. Food as a part of social rituals. The social functions of meal.Health concepts and food.Medicalization of food consumption. Perception of relations between food and health.Obesity vs. Hunger. Eating disorders and social order.Social stratification, body and food.Fashion and food in contemporary societies.Food during lifespan.Food and aesthetics.Food in TV and Media.Food and subcultures. Diets. Globalisation and industrialisation of food – changes in late modern societies.Changes in eating practices in contemporary societies. Course evaluation.	
Examination methods:		Project, Test (written or computer based), Assessment of activity during classes	

Subject name:		Social capital and civil society	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	selected fields of social and humanities, economics and environmental economics. Knows and understands the general principles of creating and developing forms of individual entrepreneurship	EP_K2_W09
Skills: (In terms of skills, the graduate can)	U1	to obtain information from literature, databases and other sources, including public opinion research reports on public trust and public institutions	EP_K2_U01
Social competences: (Within the scope of competence, the graduate is ready to)	K1	to take responsibility in fulfilling social obligations and is aware of taking initiating and organizational actions for the benefit of the social environment	EP_K2_K06
Course content ensuring the achievement of learning outcomes:		The concept of civil society; Political transformation in Poland - towards democratic system; Precursors of research on social capital; Determining the components of social capital (definition of basic concepts: social norms; social structure, social trust); Social trust in democracy; Private and public trust in Poland; "Classical" theories of social capital (J. Coleman, P. Bourdieu); Classical theories of social capital (R. Putnam, F. Fukuyama); Criticism of the concept of social capital ("negative social capital");Social capital and social commitment in Poland (research review); Election turnout in Poland; Historical basis of regional differentiation of social capital in Poland;The importance of social capital in the “network economy"	
Examination methods:		Written credit	

Nazwa zajęć:		Outdoor activity and the protected areas	Liczba ECTS: 2
Efekty uczenia się:		Treść efektu przypisanego do zajęć:	Odniesienie do efektu kierunkowego:
Wiedza: (Absolwent zna i rozumie)	W1	phenomena and processes in different types of ecosystems at different temporal and spatial scales	EP_K2_W03, EP_K2_W07
Umiejętności: (Absolwent potrafi)	U1	rules in protected areas and how to enforce them	EP_K2_U01, EP_K2_U02, EP_K2_U03
Kompetencje: (Absolwent jest gotów do)	K1	The student has an in-depth knowledge of the topic of sustainable development and its implementation at various levels of society	EP_K2_K01, EP_K2_K03, EP_K2_K05
Treści programowe zapewniające uzyskanie efektów uczenia się:		What may be treated as outdoor activity, definitions of tourism, hunting, fishing etc., historical backgrounds in Poland; Modern trends in various kinds of the tourism and the threads for the environment;The ways of preventing the environmental damages in the possibly “gentle” way; The forms of the outdoor activities organising in accordance to the sustainable development strategy; Instruments of eco-politics in Poland and other countries; Ecotourism and agro-tourism; The touristic infrastructure in the protected areas; The human impacts on the urban environment (field studies).	
Sposób weryfikacji efektów uczenia się:		Zaliczenie ustne	

Subject name:		Contaminant flow in the environment	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	how to carry out analysis and analytical description of the processes of spreading of pollutants in standing waters, flowing waters and in soil-soil media.	EP_K2_W01
	W2	limitations of of predicting the transport of pollutants in the environment.	EP_K2_W02
Skills: (In terms of skills, the graduate can)	U1	correctly determine the parameters for predicting the spread ofof pollutants in the environment.	EP_K2_U01
Social competences: (Within the scope of competence, the graduate is ready to)	K1	to verify, analyze and interpret results of calculations of the spread of of pollutants in the environment	EP_K2_K03
Course content ensuring the achievement of learning outcomes:		Fluid flow in the ground - Darcy's law. The steady and undetermined fluid flow. Mechanism of transport of contaminants in the atmosphere, standing and flowing waters. Analytical description of the process of transport of pollutants using the Fick model. Engineering methods for solving problems Predicting the transport of pollutants. Programs computational programs for solving transient one-dimensional tasks of pollutant transport in troughs. Basic physical properties of soils and soils. Soil water potential. Curve Water retention of soils. Equations of water flow in the saturated and unsaturated zones of soil-soil centers (Darcy and Buckingham-Darcy laws, continuity equations, Bussinesq and Richards). Hydraulic conductivity of soils and grounds. Capacity of soil and ground media relative to contaminants. Adsorption of contaminants in soils and soils. Diffusive and convective transport, dispersion. Initial and boundary conditions for the dispersion equation. Examples of analytical solutions and numerical solutions of the dispersion equation. Determination of Parameters of migration of pollutants. Topics audit exercises: Steady and transient Water flow in rivers and canals. Transport Diffusive, advective and advective-diffusive, Determination of turbulent diffusion coefficient and dispersion by experimental (statistical) methods and from empirical formulas. Analytical and numerical Solutions of one-dimensional equations of steady diffusion without advection in the reservoir and advection-diffusion in the trough. One-dimensional Numerical solutions for a rectangular trough in the case of sudden and continuous discharge of admixture Passive (selected calculation program) Examples of applications of analytical and numerical solutions of the dispersion equation in the media soil and ground media. Parameterization of soil-soil media soil-soil media for the purposes of forecasting pollution. Application of a selected model mathematical model to describe the flow of water and contaminants in soil.	
Examination methods:		Test (written or computer based), Project, Report	

Subject name:		Environmental conservation and landscape planning	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	role of landscape planning and environmental conservation as an element of future land development	EP_K2_W06
	W2	role of landscape and spatial planning as an instrument of nature protection and environmental conservation	EP_K2_W07
Skills: (In terms of skills, the graduate can)	U1	analyses of environmental condition for decision making process in the landscape and spatial planning	EP_K2_U02, EP_K2_U07
	U2	Can interpret planning guidelines related to the environmental protection and conservation	EP_K2_U03
Social competences: (Within the scope of competence, the graduate is ready to)	K1	present the results of the analyzes using professional English	EP_K2_K03
	K2	take on various roles in the team	EP_K2_K02
Course content ensuring the achievement of learning outcomes:		Objectives, methods and legal framework of landscape planning and environmental conservation. Landscape planning documents and environmental conservation documents at various scales and for different purpouse. Environmental study - basic document to protect landscape and natural environment for spatial planning needs. Objectives, tasks of landscape planning and environmental conservation at the regional level, assessment of the impact on the sustainable development of the area, the green belt concept - instrument to protect green open spaces in metropolitan areas. Objectives, tasks of landscape and environmental planning at the municipal level: assessment of the landscape and environmental aspects on the sustainable development of the area, Urban Natural System and its role in spatial planning. The key contemporary concepts of landscape and environmental planning: (a) green infrastructure and its importance for the spatial structure of the region / city / neighborhood; (b): Nature based solutions of adaptation to climate change in urban and rural areas.	
Examination methods:		Written credit, Case, Essay, Assessment of speeches during classes	

Subject name:		Decision support systems in environmental conservation	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	terminology and methodology of decision support using modern tools including modeling and scenario analysis.	EP_K2_W02
Skills: (In terms of skills, the graduate can)	U1	The student gains practical skills in the field of construction decision support systems in a computer environment - can develop a conceptual model of the system representing complex environmental processes.	EP_K2_U01, EP_K2_U02
	U2	The student is experienced to independently carry out simulation calculations and optimization modelling and on this basis can select the most rational environmental decision.	EP_K2_U02, EP_K2_U03
	U3	The student is experienced to present obtained modelling results using decision support tools and evaluate their potential in solving environmental problems.	EP_K2_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	work independently and in a team.	EP_K2_K02
	K2	take responsibility for decisions regarding the state of the environment taken on the basis of the system and scenario analysis, guided by the principle of predicting consequences and reducing risks.	EP_K2_K01
Course content ensuring the achievement of learning outcomes:		Familiarization with the general methodology of system analysis in the decision support process: i.e. definition of the system and its environment, formulation of the problem, defining criteria of solutions assessment, using simulation and optimization models, evaluation of the results and implementation of chosen solution. Characteristics of basic decision analysis tools such as: simulation and optimization models, uncertainty and risk analysis, game theory issues. Methods of presenting the results of the system analysis process. Global scenarios of world development – GEO7 and their importance for analytical work. Scenario approaches used in decision analysis - SAS method (story and simulation). Pictograms and "rich picture" diagrams in the presentation of environmental problems. Simulation models in the chosen software, including, among others, population analyzes or water retention analyzes. Optimization models for optimizing the allocation of funds for environmental protection. Decision games. Scenario methods – card sorting method, radar charts, fuzzy cognitive maps (FCM). Presentation of the results of the system analysis process - attitudes adopted during a conversation or working in a team.	
Examination methods:		Written exam, Assessment of speeches during classes, Project	

Nazwa zajęć:		Environmental resources valuation	Liczba ECTS: 2
Efekty uczenia się:		Treść efektu przypisanego do zajęć:	Odniesienie do efektu kierunkowego:
Wiedza: (Absolwent zna i rozumie)	W1	mutual relations between the economy, society and the natural environment	EP_K2_W07
	W2	methods of valuation of natural resources as non-market goods	EP_K2_W01
Umiejętności: (Absolwent potrafi)	U1	carry out and prezsent a valuation of natural environment resources using selected valuation methods	EP_K2_U08
Kompetencje: (Absolwent jest gotów do)	K1	estimating the value of environmental resources for sustainable development in the national and global dimension	EP_K2_K04
Treści programowe zapewniające uzyskanie efektów uczenia się:		Basic concepts of economics and ecology; sustainable development, environmental valuation; the economic value of the environment; circular economy; ecosystem services; direct methods of valuation of environmental resources; indirect methods of valuation of environmental resources, cost-benefit analysis	
Sposób weryfikacji efektów uczenia się:		Zaliczenie pisemne, Projekt, Prezentacja	

Subject name:		Riparian ecosystems conservation	ECTS: 3
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	The student is capable to describe the phenomena and processes shaping the natural environment of river valleys, as well as indicate threats to ecosystems.	EP_K2_W03
	W2	The student is capable to use advanced statistical methods and GIS tools to analyze the phenomena and processes occurring within river valleys and possesses extensive knowledge of processes modeling. The student recognizes the methods and equipment necessary to perform research in river valleys as well as is able to analyze data from environmental observations.	EP_K2_W01, EP_K2_W02
Skills: (In terms of skills, the graduate can)	U1	The student is experienced to assess the condition (and quality) of soil, water and biotic resources, indicate threats, knows the methods of stocktaking and valorization of the natural ecosystems of river valleys, and is able to plan restoration activities.	EP_K2_U01, EP_K2_U02, EP_K2_U04
	U2	The student is capable to plan and carry out research tasks in the field of environmental protection of river valleys using various sources of information as well as analytical, simulation and empirical methods, and then indicate the practical application of the results.	EP_K2_U01, EP_K2_U02, EP_K2_U07
	U3	The student has the ability to present a selected research problem with the use of multimedia techniques, knowledge of up to date literature, as well as has the competence to work independently and in a team.	EP_K2_U05, EP_K2_U08
Course content ensuring the achievement of learning outcomes:		Native and transformed ecosystems in river valleys.The role of river valleys in the protection of biodiversity. Agricultural use of river valleys and their other socio-economic functions. Threats to natural ecosystems. Hydrological processes, water supply and soil conditions of river valleys. Natural river floodings analysis methods. Groundwater supply analysis methods. Types of hydrological supply and types of wetlands. Various classification systems of wetlands. Soils of river valley areas and wetlands (classification and properties). Soil-forming processes. Soil protection with particular emphasis on organic soils. Vegetation of river valleys and wetlands.Natural and transformed plant communities. Methods of vegetation inventory. Inventory methods of invertebrate and vertebrate fauna. Alien invasive and expansive plant species and fauna. Methods of the natural and landscape valorization (Including: valorization of individual taxa of plants and animals; valorization in terms of key species). Analysis of processes shaping plant communities in river valleys and wetlands (climate, water and soil conditions, human activity). Engineering activities in river valleys, constructed wetlands, retention reservoirs, drainage systems, fish ponds, levees and their impact on wetland ecosystems. Technical issues and problems of wetland melioration. Water management and intensive/extensive agricultural issues. Protection and reclamation of ecosystems in river valleys.	
Examination methods:		Written credit, Project, Presentation	

Subject name:		Noise protection	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	issues in statistics used for the assessment and interpretation of noise hazard in the environment	EP_K2_W01
	W2	principles of spatial planning with recpects acoustic climate optimalization	EP_K2_W07
Skills: (In terms of skills, the graduate can)	U1	analyze processes of noise propagation in a cause-and-effect relationship system using statistical methods and IT tools	EP_K2_U01
	U2	analyze the risks analysis of the noise in the environment	EP_K2_U04
Social competences: (Within the scope of competence, the graduate is ready to)	K1	identify noise hazards, set priorities for actions, and responsibly carry out tasks	EP_K2_K03
Course content ensuring the achievement of learning outcomes:		Basic acoustic. Noise criteria. Sources of mechanical and acoustic vibrations. Effect of noise on the human organism. On the auditory system and other functions. Monitoring of noise: measurement and systems of sound level detection unit; environmental noise measurement; the concept of acoustic climate. The principles of sound barrier projects include estimations of breaks.	
Examination methods:		Written credit, Oral credit, Project, Report	

Subject name:		Diploma seminar I of specialization Restoration and Management of Environment	ECTS: 4
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	Student knows principles of the IMRAD approach in communicating results of scientific research.	EP_K2_W05
	W2	Student knows the rules of forumlating and verifying scientific hypothesis.	EP_K2_W05
Skills: (In terms of skills, the graduate can)	U1	Student is capable to prepare M.Sc. thesis in the IMRAD structure.	EP_K2_U02, EP_K2_U05, EP_K2_U06, EP_K2_U07, EP_K2_U08
	U2	Student can prepare and present comprehensive presentation and discuss selected issues with the fellows.	EP_K2_U06, EP_K2_U07
	U3	Student can verify research hypothesis in a structured research approach.	EP_K2_U07
Social competences: (Within the scope of competence, the graduate is ready to)	K1	Student is ready to discuss the results of carried research task and find theoretical and practical contexts of the research.	EP_K2_K06
	K2	Student is ready to communicate results of carried research in a structured way.	EP_K2_K04
Course content ensuring the achievement of learning outcomes:		Principles of scientific writing and IMRAD approach. Technical and editorial principles of scientific text (thesis) preparation including title of the thesis, abstract, introduction & discussion. Research papers searching, reading, reviewing, and synthesizing. Preparing presentation: principles, guidelines,and rules. Preparing comprehensive replies to questions listed as the M.Sc. exam principle. Using elements of artificial intelligence (AI) in M.Sc. thesis preparation.	
Examination methods:		Written credit, Presentation	

Subject name:		Mathematical statistics	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	basis notions of probablity theory	EP_K2_W01
	W2	baisc elements of statistical reasoning	EP_K2_W01
Skills: (In terms of skills, the graduate can)	U1	to analyze simple data with statistical software	EP_K2_U01
	U2	to draw conclusions from statistical analysis	EP_K2_U01
Social competences: (Within the scope of competence, the graduate is ready to)	K1	to make a simple analysis of data and draw a conclusion	EP_K2_K01
	K2	to estimate risks using statistical methods	EP_K2_K01
Course content ensuring the achievement of learning outcomes:		Basic notions of probability (events, sample space, conditional and total probability, Bayes Rule). Random variables (discrete and continuous) density, cumulative distribution function, expectation and variance. Basic distributions (Binomial, Poisson, Normal, Log-Normal). Linear and nonlinear regression. Estimation of distribution parameters, confidence intervals for mean, variance and standard deviation in normal population; for correlation coefficients. Tests for statistial hypothesis (theory, errors of 1 and 2 kind, power of the test).Parametric tests for mean in normal population, mean in large sample, t-Student test.Non-parametric tests : chi-square, Shapiro-Wilk's.	
Examination methods:		Written credit, Project, Assessment of activity during classes	

Subject name:		Risk Analysis	ECTS: 2
Effects:		The content of the effect assigned to the subject:	Directional effect reference:
Knowledge: (In terms of knowledge, the graduate knows and understands)	W1	basic concepts of risk analysis	EP_K2_W03
	W2	how to analyze threats using event trees	EP_K2_W01, EP_K2_W03
	W3	basic concepts of reliability theory	EP_K2_W01, EP_K2_W03
Skills: (In terms of skills, the graduate can)	U1	analyze reliability using the fault tree method	EP_K2_U03, EP_K2_U04
	U2	use the method of logical trees in risk analysis	EP_K2_U01, EP_K2_U04
Social competences: (Within the scope of competence, the graduate is ready to)	K1	applying the ALARP principle (As low as Reasonably Practicable)	EP_K2_K01
Course content ensuring the achievement of learning outcomes:		Basic concepts of risk analysis. Identification of adverse events. Basic concepts of probabilistics. Risk measures. Risk acceptability issues. Risk analysis methods (PHA, FMEA, HAZOP, logical tree methods). Reliability modeling. ALARP principle. Presentation of selected applications of risk estimation research. Examples of event trees. Examples of error trees - analysis of reliability structures. Application of the event tree and fault tree methods for risk estimation.	
Examination methods:		Written credit, Presentation, Project	

Nazwa zajęć:		Diploma seminar II of specialization Restoration and Management of Environment	Liczba ECTS: 2
Efekty uczenia się:		Treść efektu przypisanego do zajęć:	Odniesienie do efektu kierunkowego:
Wiedza: (Absolwent zna i rozumie)	W1	Student knows principles of the IMRAD approach in communicating results of scientific research.	EP_K2_W05
	W2	Student knows the rules of forumlating and verifying scientific hypothesis.	EP_K2_W05
Umiejętności: (Absolwent potrafi)	U1	Student is capable to prepare M.Sc. thesis in the IMRAD structure.	EP_K2_U02, EP_K2_U05, EP_K2_U06, EP_K2_U07, EP_K2_U08
	U2	Student can prepare and present comprehensive presentation and discuss selected issues with the fellows.	EP_K2_U06, EP_K2_U07
	U3	Student can verify research hypothesis in a structured research approach.	EP_K2_U07
Kompetencje: (Absolwent jest gotów do)	K1	Student is ready to discuss the results of carried research task and find theoretical and practical contexts of the research.	EP_K2_K06
	K2	Student is ready to communicate results of carried research in a structured way.	EP_K2_K04
Treści programowe zapewniające uzyskanie efektów uczenia się:		Principles of scientific writing and IMRAD approach. Technical and editorial principles of scientific text (thesis) preparation including title of the thesis, abstract, introduction & discussion. Research papers searching, reading, reviewing, and synthesizing. Preparing presentation: principles, guidelines,and rules. Preparing comprehensive replies to questions listed as the M.Sc. exam principle. Using elements of artificial intelligence (AI) in M.Sc. thesis preparation.	
Sposób weryfikacji efektów uczenia się:		Zaliczenie pisemne, Prezentacja	

Programme indicators

2023/24/S_D/2/BIS/EP/all

Name	Value
Potwierdzenie – na podstawie planu studiów, że student realizuje zajęcia z dziedziny nauk humanistycznych i/lub społecznych, którym przypisano nie mniej niż 5 punktów ECTS	5
Potwierdzenie – na podstawie planu studiów, że student ma możliwość wyboru zajęć, którym łącznie przypisano liczbę punktów ECTS nie niższą niż 30% ECTS określonych dla programu tych studiów	48/90 (53.33%)
Potwierdzenie, że program studiów o profilu ogólnoakademickim obejmuje zajęcia związane z prowadzoną w uczelni działalnością naukową, w wymiarze większym niż 50% liczby punktów ECTS, określonej dla programu tych studiów	45/90 (50%)
Potwierdzenie, że liczba punktów ECTS uzyskanych w programie studiów poprzez realizację zajęć z wykorzystaniem metod i technik kształcenia na odległość jest nie wyższa niż 75% ogólnej liczby punktów ECTS w programie studiów o profilu ogólnoakademickim	0/90 (0%)
Liczba godzin w programie	989