University of Gdańsk

Subject card

Subject name and code	Geoinformation in environmental monitoring (Lecture), PG_00201202		
Field of study	Physical geography and geoinformation		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	academic	Assessment form	credit
Conducting unit	Climate Research Laboratory -> Department of Physical Oceanography and Climate Research -> Faculty of Oceanography and Geography -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Roman Cieśliński	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	0.0	0.0	0.0	30

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	4.0	41.0	75

Subject objectives

- To intruduce students with the organization and principles of environmental monitoring, factors causing pollution of individual environmental components, assessment of their condition and adopted quality standards.
- Discussion of the main methods and principles of organizing the network of meteorological, air quality, hydrological and natural measurements and observations.
- Discussion of the possibilities of using spatial analysis methods (in particular GIS) in environmental monitoring, as well as current practices in this area.

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[GFGMU2_U04] is able to analyse and interpret the causes and course of physical-geographical processes and phenomena, selects and applies advanced research methods and tools, including statistical and geoinformatics methods, and critically interprets the results obtained, drawing conclusions and formulating their own position on that basis, justified in debate.	student is able to analyze and interpret the state, causes and effects of natural and anthropogenic processes occurring in the environment, is able to use advanced geographical information systems and synthesize the issues discussed	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report [SU4] test/exam - oral or written
	[GFGMU2_U03] is able to use academic literature in the fields of physical geography and geoinformation in Polish and English, selecting it appropriately for the research objective	the student is able to search and use texts, legal acts and websites in Polish and English	[SU4] test/exam - oral or written
	[GFGMU2_K03] is ready to accepting responsibility for group work assuming various roles in it, participating in preparation of scientific projects, taking responsibility for the equipment and safety rules, active developing of professional competences and knowledge in Earth and environmental sciences and geoinformation, including interdisciplinarity, as well as developing the principles of professional ethics, respecting copyright rules	student is able to cooperate in a group in the organization and implementation of tasks related to environmental monitoring, is aware of the responsibility for measuring equipment and software, is aware of the need to update his knowledge and professional competences in compliance with ethical principles	[SK1] oral statement/conversation/ discussion [SK8] observation of student's independent or team work
	[GFGMU2_K01] is ready to critically assess the knowledge obtained in the field of Earth and environmental sciences, particularly physical geography and geoinformation, its completion and verification through further critical analysis of scientific literature	Sttudent is able to verify the state of his knowledge about environmental elements, the principles of environmental monitoring and geoinformation, he is able to supplement and update his knowledge using literature, software and legal acts.	[SK1] oral statement/conversation/ discussion [SK4] test/exam - oral or written
	[GFGMU2_U02] is able to precisely and appropriately use terminology in the field of physical geography and geoinformation in oral statements and written works	student knows the concepts and definitions relevant to monitoring research, legal acts relating to the environment and its monitoring, is able to use these concepts at an advanced level	[SU1] oral statement/conversation/ discussion [SU4] test/exam - oral or written
	[GFGMU2_W03] knows and understands in a deepened extent issues in the theory of geographic information systems, basics of organization and operation of spatial information infrastructures and possibilities of using geoinformatics tools in physical geography	the student knows and uses geographic information systems in environmental monitoring at an advanced level,student is able to identify the tools used in various environmental monitoring programs	[SW4] test/exam - oral or written [SW2] presentation/project/paper/ report

Subject contents	egal basis of environmental monitoring (lecture) State Environmental Monitoring (PMŚ) goals, structure, subsystems. PMŚ programs, implementing institutions (lecture) principles of creating a monitoring network (lecture) use of monitoring research results (lecture, work using websites) T ools for integrating and processing data about the natural environment (lecture, work using websites) DPSIR model (lecture, independent and group work) L andslide monitoring (SOPO) goals and importance (lecture) Selected international organizations and systems of environmental monitoring (lecture) Integrated Monitoring of the Natural Environment (ZMŚP). (lecture) The INSPIRE Directive (Infrastructure for Spatial Information in Europe), (lecture, work using websites) European Environment Agency (EEA) (lecture, work using websites) GEOPORTALS, EKOPORTAL providing information about the environment. (lecture, work using websites) DPSIR model (lecture, independent and group work) Online data processing (lecture, work using websites) Possibilities / obstacles to the effective use of GIS tools in environmental monitoring (lecture, work using websites)
Prerequisites and co-requisites	

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written test with questions and tasks)	100.0%	100.0%

Recommended reading	Basic literature	European environment Status and forecasts. EEA, Copenhagen Strategic Program for State Environmental Monitoring, GIOŚ Warsaw. Report on the state of the environment in Poland, GIOŚ, Warsaw. Reports on the state of the environment in the Pomeranian Voivodeship, GIOŚ, Gdańsk.

	Supplementary literature	Hydrographic Map of Poland at a scale of 1:50,000, Technical Guidelines, 2005, Chief Surveyor of the Country, Gokart, Rzeszów. Sozological map of Poland at a scale of 1:50,000, Technical Guidelines, 2005, Chief Surveyor of the Country, Gokart, Rzeszów. Geoenvironmental map of Poland at a scale of 1:50,000, PGI, Warsaw. DIRECTIVE 2000/60/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 23 October 2000 establishing a framework for Community action in the field of water policy. Regulation of the Minister of the Environment of November 15, 2011 on the forms and methods of monitoring surface and groundwater bodies, DZ. U. 2011, No. 258, item 1550. Act of July 20, 1991 on the Environmental Protection Inspection, Journal of Laws 1991 no. 77 item 335. Regulation of the Ministry of the World of August 24, 2012 on the levels of certain substances in the air System for monitoring and protecting the country, 1999, IMWM, Warsaw. The health status of forests in Poland, 2017, Forest Research Institute and State Forests, Warsaw.
	eResources addresses	
Example issues/ example questions/ tasks being completed	List selected satellite imaging systems used in environmental monitoring Which EU Directives play the main role in nature monitoring? Expand the SOPO abbreviation List the features of environmental monitoring studies	
Work placement	Not applicable	

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