University of Gdańsk

Subject card

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| 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<br>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 | | dr Małgorzata Owczarek | | | | |
| | 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.<br>• Discussion of the main methods and principles of organizing the network of meteorological, air quality, hydrological and natural measurements and observations.<br>• 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 |
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| [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<br>[SW2] presentation/project/paper/ report |
| [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<br>[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 prepared to fulfil professional responsibilities in both independent and team-based work by advancing the field of geography, upholding the profession's ethos, adhering to and developing the principles of professional ethics, and ensuring compliance with these principles | 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<br>[SK8] observation of student's independent or team work |
| [GFGMU2_K01] is able to behave appropriately in the workplace and in everyday life by critically evaluating information received in the light of their existing knowledge, recognising the importance of knowledge in solving cognitive and practical problems, and, when faced with difficulties, drawing on expert knowledge | Student is able to verify and interpret data and information from environmental monitoring systems, and is able to supplement his/her knowledge using reliable sources. | [SK1] oral statement/conversation/ discussion<br>[SK4] test/exam - oral or written |
| [GFGMU2_U04] is able, either independently or as part of a group, to formulate and test hypotheses regarding the causes and progression of physical-geographical processes and phenomena; selects and applies advanced research methods and tools, including statistical and geoinformatics methods, adapting them to the context where necessary; skilfully visualises the results of spatial data analysis, critically interprets the findings, and formulates conclusions and their own position based on these, which they justify in debate | Student is able to analyze the state of the environment based on monitoring data, formulate and verify hypotheses regarding changes in the environment, selecting analysis and presentation methods appropriate to the issue under study, including statistical and geoinformatic methods, is able to formulate and justify a position in a scientific discussion on the state and changes in the environment. | [SU1] oral statement/conversation/ discussion<br>[SU2] presentation/project/paper/ report<br>[SU4] test/exam - oral or written |

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| Subject contents | egal basis of environmental monitoring (lecture)<br><br>State Environmental Monitoring (PMŚ) goals, structure, subsystems.<br><br>PMŚ programs, implementing institutions (lecture)<br><br>principles of creating a monitoring network (lecture)<br><br>use of monitoring research results (lecture, work using websites) T<br><br>ools for integrating and processing data about the natural environment (lecture, work using websites)<br><br>DPSIR model (lecture, independent and group work) L<br><br>andslide monitoring (SOPO) goals and importance (lecture)<br><br>Selected international organizations and systems of environmental monitoring (lecture)<br><br>Integrated Monitoring of the Natural Environment (ZMŚP). (lecture)<br><br>The INSPIRE Directive (Infrastructure for Spatial Information in Europe), (lecture, work using websites)<br><br>European Environment Agency (EEA) (lecture, work using websites)<br><br>GEOPORTALS, EKOPORTAL providing information about the environment. (lecture, work using websites)<br><br>DPSIR model (lecture, independent and group work)<br><br>Online data processing (lecture, work using websites)<br><br>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 |
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| written test with questions and tasks) | 100.0% | 100.0% |

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

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| | Supplementary literature | Hydrographic Map of Poland at a scale of 1:50,000, Technical Guidelines, 2005, Chief Surveyor of the Country, Gokart, Rzeszów.<br><br>Sozological map of Poland at a scale of 1:50,000, Technical Guidelines, 2005, Chief Surveyor of the Country, Gokart, Rzeszów.<br><br>Geoenvironmental map of Poland at a scale of 1:50,000, PGI, Warsaw.<br><br>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.<br><br>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.<br><br>Act of July 20, 1991 on the Environmental Protection Inspection, Journal of Laws 1991 no. 77 item 335.<br><br>Regulation of the Ministry of the World of August 24, 2012 on the levels of certain substances in the air<br><br>System for monitoring and protecting the country, 1999, IMWM, Warsaw. The health status of forests in Poland, 2017,<br><br>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<br><br>Which EU Directives play the main role in nature monitoring?<br><br>Expand the SOPO abbreviation<br><br>List the features of environmental monitoring studies | |
| Work placement | Not applicable | |

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