University of Gdańsk

Subject card

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|---|---|---|---|---|---|---|---|
| Subject name and code | Maps and GIS - laboratory, PG_00206142 | | | | | | |
| Field of study | Oceanography | | | | | | |
| Date of commencement of studies | October 2026 | | Academic year of realisation of subject | | 2027/2028 | | |
| Education level | Bachelor's studies | | Subject group | | Obligatory subject group in the field of study | | |
| Mode of study | full-time studies | | Mode of delivery | | at the university | | |
| Year of study | 2 | | Language of instruction | | Polish | | |
| Semester of study | 4 | | ECTS credits | | 2.0 | | |
| Learning profile | academic | | Assessment form | | credit | | |
| Conducting unit | Geographic Information System (GIS) Laboratory -> Faculty of Oceanography and Geography -> Rector | | | | | | |
| Name and surname of lecturer (lecturers) | Subject supervisor | | dr Maciej Markowski | | | | |
| | Teachers | | | | | | |
| Lesson types | Lesson type | Lecture | Tutorial | Laboratory | Project | Seminar | SUM |
| | Number of study hours | 0.0 | 0.0 | 40.0 | 0.0 | 0.0 | 40 |
| | 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 | 40 | | 3.0 | | 7.0 | 50 |
| Subject objectives | Familiarization with the components of GIS as a computer system and its tasks (using ArcGIS Pro as example). Learning the basic concepts of geoinformation technology, the specifics of spatial data, and methods for modeling and visualizing them. Acquiring theoretical foundations and skills for describing the location of data on the Earth's surface. Understanding methods for acquiring primary and secondary data for GIS and their preliminary processing. Getting acquainted with basic vector and raster functions. Learning the principles and methods for presenting work results in the form of maps. | | | | | | |

## Learning outcomes

| Course outcome | Subject outcome | Method of verification |
|---|---|---|
| [OCEANL3-U05] is able to use general-purpose and specialized software, as well as mathematical and statistical methods, in data analysis and the presentation of results | The student is capable of using specialized computer software (ArcGIS Pro) and methods for analyzing spatial data related to the marine environment and presenting the results of these analyses in the form of maps. Contents: B.1-B.11. | [SU2] presentation/project/paper/ report<br>[SU4] test/exam - oral or written |
| [OCEANL3-W05] has an advanced knowledge of techniques, research methods, and tools (mathematical, statistical, and computational) used by oceanographers to describe and interpret processes and phenomena occurring in the marine environment | The student has advanced knowledge of the significance of basic geoinformatics techniques and tools used by oceanographers to describe and interpret phenomena and processes occurring in the aquatic environment. Contents: B.1-B.11. | [SW4] test/exam - oral or written<br>[SW2] presentation/project/paper/ report |
| [OCEANL3-U04] is able to independently search for information in Polish and foreign specialist literature, as well as on the Internet and in databases | The student is capable of independently searching for source information, including archival and electronic spatial databases, as well as Polish and foreign map services, in the field of oceanographic issues. They critically analyze and synthesize the information and data obtained. Contents: B.1-B.11. | [SU2] presentation/project/paper/ report<br>[SU4] test/exam - oral or written |
| [OCEANL3-K03] is ready to exercise caution and criticism in accepting information from scientific literature, the Internet and other media relating to natural sciences | The student is prepared to exercise caution when accepting information from the Internet and other media and to assess the quality of obtained data related to the natural sciences. Contents: B. 4-B.7. | [SK2] presentation/project/paper/ report |

## Subject contents

B.1 The concept of geotechnology and spatial data. Coordinate systems. Projections.
B.2 Familiarization with the ArcGIS Pro interface, exploration of spatial data. Metadata.
B.3 Spatial data models. Digital maps. Data symbolization.
B.4 Utilization of various data sets. Exploration and analysis of attribute data.
B.5 Working with point data obtained from various sources (spatial and non-spatial).
B.6 Registration of spatial data in a coordinate system. The concept of georeferencing and rectification.
B.7 Data input and editing. On-screen digitization.
B.8 Overview of basic vector analysis functions. Vector modeling.
B.9 Overview of basic raster analysis functions. Raster modeling.
B.10 Digital terrain model: determining slope and its direction, creating contour lines.
B.11 Understanding principles and methods of presenting work results in the form of maps. Creating maps at different scales and using various projections.

## Prerequisites and co-requisites

## Assessment methods and criteria

| Subject passing criteria | Passing threshold | Percentage of the final grade |
|---|---|---|
| Practical and theoretical exercises | 51.0% | 60.0% |
| Test | 51.0% | 40.0% |

## Recommended reading

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| Basic literature | - Gic-Grusza, G, Kryla-Staszewska, L., Urbański, J., Warzocha, J., Węsławski, JM (eds.). 2009. Atlas siedlisk dna polskich obszarów morskich.<br>- Zwoliński Z.(red.) , 2010, GIS woda w środowisku, Bogucki Wydawnictwo Naukowe.<br>- Urbański J.,Wochna A.,2012, Wykorzystanie danych obrazowych w GIS do analizy wód powierzchniowych [w] Zwoliński Z.(red.) GIS : teledetekcja środowiska, Bogucki Wydawnictwo Naukowe. |
| Supplementary literature | - Law M., Collins A., 2016, Getting to Know ArcGIS Pro, ESRI Press.<br>- Bakiewicz-Grabowska E., Markowski M., Lemańczyk K., 2016, Application of geoinformation techniques to determine zones of sediment resuspension induced by wind waves in lakes (using two lakes from Northern Poland as examples), Limnological Review 16(1): 3-14. |
| eResources addresses | |

## Example issues/ example questions/ tasks being completed

## Work placement

Not applicable

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