

**Subject card**

|   |   |  |   |                                     |  |            |     |
|---|---|--|---|-------------------------------------|--|------------|-----|
| Subject name and code                       | Sediment chemistry, PG_00192995   |  |   |                                     |  |            |     |
| Field of study                              | Geology   |  |   |                                     |  |            |     |
| Date of commencement of studies             | October 2026  | Academic year of realisation of subject                  |   |                                     | 2028/2029  |            |     |
| Education level                             | Bachelor's studies  | Subject group  |   |                                     | Obligatory subject group in the field of study<br>Optional subject group |            |     |
| Mode of study                               | full-time studies   | Mode of delivery   |   |                                     | at the university  |            |     |
| Year of study                               | 3   | Language of instruction                                  |   |                                     | Polish   |            |     |
| Semester of study                           | 5   | ECTS credits   |   |                                     | 2.0  |            |     |
| Learning profile                            | academic  | Assessment form  |   |                                     | credit   |            |     |
| Conducting unit                             | Laboratory of Toxic Substances Transformation -> Department of Chemical Oceanography and Marine Geology -> Faculty of Oceanography and Geography -> Rector  |  |   |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor  |  | dr hab. Bożena Graca  |                                     |  |            |     |
|   | 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   |   | 2.0                                 |  | 18.0       | 50  |
| Subject objectives                          | The aim of the course is to familiarize students with basic issues related to chemistry sediments. Information is presented about the importance of bottom sediments in the ecosystem and factors processes that shape their chemical composition. Methods of collection and composition testing are discussed chemical sediments and interstitial waters and estimating the rate of biogeochemical processes in within the sediment  |  |   |                                     |  |            |     |
| Learning outcomes                           | Course outcome  |  | Subject outcome   |                                     | Method of verification   |            |     |
|   | [GEOLL3_W02] knows and understands the terminology appropriate in science and natural sciences  |  | knows and understands the terminology appropriate in research biogeochemical bottom sediments           |                                     | [SW4] test/exam - oral or written  |            |     |
|   | [GEOLL3_W01] knows and understands the basic natural phenomena and explains their course in relation to geological processes  |  | knows and understands the basics natural phenomena and explains their course about geological processes |                                     | [SW4] test/exam - oral or written  |            |     |
| Subject contents                            | <p>Topics of the lecture</p> <p>The importance of bottom sediments in the aquatic environment. Natural (biotic and abiotic) and anthropogenic factors (supply of chemical pollutants, bottom trawling, dredging works) shaping the chemical properties of bottom sediments. The circulation cycle of elements in the water-sediment contact zone on the example of nutritional elements. The use of stable isotopes and radioisotopes in the study of bottom sediments. Methods of collecting sediment samples, their preservation and storage in chemical tests. Sequential analyzes in the study of the chemical composition of sediments, using the example of phosphorus. Interstitial water recovery methods, chemical composition, factors influencing variability. Disproportionation of organic matter, influence on pH, Eh, alkalinity, formation of gases in sediments. Clay minerals - reverse weathering. The use of sediment incubation to study biogeochemical processes in sediments (exchange elements in the zone of contact between water and sediment, denitrification and nitrification rate)</p> |  |   |                                     |  |            |     |

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| Prerequisites and co-requisites                                |   |   |                               |
| Assessment methods and criteria                                | Subject passing criteria  | Passing threshold   | Percentage of the final grade |
|  | pass evaluation   | 51.0%   | 100.0%                        |
| Recommended reading  | Basic literature  | Schulz i Zabel 2000 (red.), Marine Geochemistry. Springer-Verlag Berlin-Heidelberg<br>Starmach, K., Wróbel, S., i Pasternak, K., (red.), Hydrobiologia. Państwowe Wydawnictwo Naukowe, Warszawa<br>E.M. Emelyanov (red.), 2002, Geology of the Gdańsk Basin, Baltic Sea. Russian Academy of Sciences, Yantarny skaz, Kaliningrad<br>Libes, S.M., 1992. An introduction to marine biogeochemistry. Wiley and Sons, New York, 743 s.<br>Wulff, F., Rahm, L.A. i Larsson, I.P., (red.), 2001, A systems analysis of the Baltic Sea<br>Czasopisma naukowe |                               |
|  | Supplementary literature  | Wybrane artykuły naukowe z zakresu chemii osadów dennych<br>Graca, B., 2009, Dynamika przemian azotu i fosforu w strefie kontaktu wody z osadem dennym w Zatoce Gdańskiej, Wydawnictwo Uniwersytetu Gdańskiego  |                               |
|  | eResources addresses  |   |                               |
| Example issues/<br>example questions/<br>tasks being completed | The role of sediments in shaping the chemical composition of other spheres of the Earth |   |                               |
|  | Experimental methods in the study of processes occurring in sediments                   |   |                               |
| Work placement   | Not applicable  |   |                               |

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