



Subject card

|   |  |  |          |   |         |  |     |
|---|--|--|----------|---|---------|--|-----|
| Subject name and code                       | , PG_00058842  |  |          |   |         |  |     |
| Field of study                              | Environmental Engineering  |  |          |   |         |  |     |
| Date of commencement of studies             | October 2022   |  |          | Academic year of realisation of subject |         | 2024/2025  |     |
| Education level                             | first-cycle studies  |  |          | Subject group                           |         | Optional subject group<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                               | 3  |  |          | Language of instruction                 |         | Polish   |     |
| Semester of study                           | 6  |  |          | ECTS credits                            |         | 4.0  |     |
| Learning profile                            | general academic profile   |  |          | Assessment form                         |         | assessment   |     |
| Conducting unit                             | Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering |  |          |   |         |  |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   |  |          | dr hab. inż. Piotr Zima                 |         |  |     |
|   | Teachers   |  |          |   |         |  |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial | Laboratory                              | Project | Seminar  | SUM |
|   | Number of study hours  | 15.0   | 0.0      | 15.0                                    | 15.0    | 0.0  | 45  |
|   | 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  | 45   |          | 6.0                                     |         | 50.0   | 101 |
| Subject objectives                          | Introducing students to the problems related to the transport of pollutants in water and in the air    |  |          |   |         |  |     |

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| Learning outcomes               | Course outcome  | Subject outcome  | Method of verification   |
|                                 | [K6_W06] has a structured and theoretically founded knowledge in the field of computer science, numerical methods and the possibilities of their applications for solving tasks, description of phenomena related to the flow of water in the environment, in open pipes and channels, filtration, migration of pollutants  | The student has knowledge of mathematics and numerical methods in solving problems related to the transport of pollution   | [SW1] Assessment of factual knowledge  |
|                                 | K6_W12  | The student understands the basic physical and geochemical processes occurring within the atmosphere, lithosphere and hydrosphere, in particular in the field of water and air movement, geological processes and the transport of heat and pollutants | [SW1] Assessment of factual knowledge  |
|                                 | [K6_K01] can think and act in a creative and enterprising way; can set priorities for the implementation of an individual or group task; understands the need for continuous training and professional responsibility for their activities and team   | The student is able to define priorities for the implementation of an individual or group task; understands the need for continuous education and taking professional responsibility for his/her own and the team's activities                         | [SK3] Assessment of ability to organize work<br>[SK5] Assessment of ability to solve problems that arise in practice |
|                                 | [K6_W04] possesses elementary knowledge in the field of land mechanics, ground science, land reclamation and geotechnics; has basic knowledge about the composition of air, water and soil, environmental pollution and processes responsible for their formation and ways to reduce them, knows the principles and organization of sustainable water management  | The student has basic information on the fundamental processes influencing environmental pollution   | [SW1] Assessment of factual knowledge  |
|                                 | [K6_W05] knows the theoretical basis of hydromechanics and its practical models, necessary to solve technical problems in the field of environmental engineering (sanitary engineering, water melioration, water management and flood protection, pollution spread)   | The student has knowledge of the impact of pollution on the infrastructure   | [SW1] Assessment of factual knowledge  |
| Subject contents                | <p>WYKŁADPrzedstawienie podstawowych równań opisujących zachowanie się substancji rozproszonych w wodzie i w powietrzu. Dyfuzja, dyfuzja burzliwa, dyspersja - podstawowe mechanizmy transportu. Opis i równania funkcji źródłowych. Rozwiązania równań opisujących funkcje źródłowe. Model BZT5-tlen rozpuszczony. Rozwiązania równania transportu: równanie dyfuzji, adwekcji-dyspersji i adwekcji-dyfuzji/dyspersji-reakcji.ĆWICZENIAProjekt grupowy osadnika. Projekt grupowy emitera do atmosfery.</p> |  |  |
| Prerequisites and co-requisites | Knowledge of the subject of mathematics, physics, computer science  |  |  |
| Assessment methods and criteria | Subject passing criteria  | Passing threshold  | Percentage of the final grade  |
|                                 | Group project   | 60.0%  | 50.0%  |
|                                 | Substantive knowledge test  | 60.0%  | 50.0%  |
| Recommended reading             | Basic literature  | 1. Sawicki J.M., "Przenoszenie masy i energii", Wyd. PG,Gdańsk 1993.<br><br>2. Sawicki J.M., "Migracja zanieczyszczeń", Wyd. PG, Gdańsk 2003.  |  |
|                                 | Supplementary literature  | 1. Chapara S.C., "Surface Water-Quality Modeling", 1996.   |  |
|                                 | eResources addresses  | Adresy na platformie eNauczanie:   |  |

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| Example issues/<br>example questions/<br>tasks being completed | List the basic processes of transporting substances in water and air. Describe the basic source functions in the pollutant transport equation. Describe the BOD5-Dissolved Oxygen model |
| Work placement   | Not applicable  |

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