



## Subject card

|   |  |  |  |                                     |  |            |     |
|---|--|--|--|-------------------------------------|--|------------|-----|
| Subject name and code                       | Meteorology, PG_00058754   |  |  |                                     |  |            |     |
| Field of study                              | Environmental Engineering  |  |  |                                     |  |            |     |
| Date of commencement of studies             | October 2025   |  | Academic year of realisation of subject  |                                     | 2025/2026  |            |     |
| Education level                             | first-cycle 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   |                                     | 2.0  |            |     |
| Learning profile                            | general academic profile   |  | Assessment form  |                                     | assessment   |            |     |
| Conducting unit                             | Faculty Office Faculty Of Civil And Environmental Engineering -> Faculty Of Civil And Environmental Engineering -> Wydziały Politechniki Gdańskiej   |  |  |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   |  | dr hab. inż. Dariusz Gąsiorowski   |                                     |  |            |     |
|   | Teachers   |  |  |                                     |  |            |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial   | Laboratory                          | Project  | Seminar    | SUM |
|   | Number of study hours  | 15.0   | 15.0   | 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   |  | 5.0                                 |  | 20.0       | 55  |
| Subject objectives                          | Understanding a basic knowledge in the field of meteorology at the level necessary for the environmental engineering specialist. Understanding of basic concepts related to the composition and properties of the atmosphere. Understanding of basic physical processes taking place in the atmosphere, such as the circulation of heat and humidity in the atmosphere, water's changes of state, moisture and cloud formation, percipitation fromation, general atmosphere circulation and local circulation. Acquiring basic skills in the field of reading and observing meteorological elements. |  |  |                                     |  |            |     |
| Learning outcomes                           | Course outcome   |  | Subject outcome  |                                     | Method of verification   |            |     |
|   | [K6_W01] has knowledge in the field of mathematics, including: linear algebra, mathematical analysis and elements of mathematical statistics, probability theory, applications of mathematics, including mathematical methods and numerical methods, necessary for: 1) description and analysis of hydrological phenomena; 2) description and analysis of meteorological phenomena; 3) solving project tasks of the sanitary industry;   |  | Student is able to carry out calculations related to the determination of basic meteorological parameters.                           |                                     | [SW3] Assessment of knowledge contained in written work and projects   |            |     |
|   | [K6_U15] can make interpretations of measured meteorological parameters, define basic elements characterizing the weather and climate  |  | Student is able to use data sets in the field of meteorology and climatology to analyze environmental engineering problems.          |                                     | [SU2] Assessment of ability to analyse information<br>[SU4] Assessment of ability to use methods and tools           |            |     |
|   | K6_W12   |  | Student masters the basic knowledge in the field of meteorology at the level necessary for a specialist in environmental engineering |                                     | [SW3] Assessment of knowledge contained in written work and projects<br>[SW1] Assessment of factual knowledge        |            |     |

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| Subject contents   | Subject, development and tasks of meteorology. The weather and its typical elements. Measurements and meteorological observations. Atmosphere. The chemical composition and vertical structure of the atmosphere. Water and atmospheric aerosol. The quantities that determine the physical state of the atmosphere. The importance of the shape and motion of the Earth in the physical processes taking place in the atmosphere and on the surface of the Earth. Radiation of the Sun, Earth and atmosphere. Processes of absorbing, diffusing and reflecting radiation in the atmosphere. Thermal balance of the atmosphere and the Earth. Adiabatic processes, vertical temperature gradient and vertical balance of the atmosphere. Water in the atmosphere. The water vapor in the atmosphere. Condensation of water vapor. Conditions for the creation of particular types of clouds. Fogs and atmospheric precipitation. Air pressure. Vertical and horizontal pressure gradient. Typical barometric systems. Atmosphere dynamics. Geostrophic and gradient wind. Global atmosphere circulation. Local winds - breeze and fen. Westerlies and monsoons. Extreme phenomena: storms, tornadoes and hurricanes. Air masses, their types, characteristics. Atmospheric fronts - classification, properties, types of weather accompanying the passage of fronts. The formation and development of low- and high-pressure systems. The main causes of weather changes. Methods of meteorological forecasting. |   |                               |
| Prerequisites and co-requisites                                | Knowledge in mathematics, physics.   |   |                               |
| Assessment methods and criteria                                | Subject passing criteria   | Passing threshold   | Percentage of the final grade |
|  | Tutorial test  | 50.0%   | 20.0%                         |
|  | Homework   | 50.0%   | 60.0%                         |
|  | Lecture test   | 50.0%   | 20.0%                         |
| Recommended reading  | Basic literature   | 1. Lutgens F. K. and Tarbuck E. J.: The Atmosphere. Prentice Hall, New Jersey 2004. |                               |
|  | Supplementary literature   | 1. Holton J. R.: An Introduction to Dynamic Meteorology. Elsevier, Amsterdam 2004.  |                               |
|  | eResources addresses   | Adresy na platformie eNauczanie:  |                               |
| Example issues/<br>example questions/<br>tasks being completed |  |   |                               |
| Work placement   | Not applicable   |   |                               |

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