



## Subject card

|                                             |                                                                                                                                                              |                                                          |                                         |                                     |                   |            |     |
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| Subject name and code                       | , PG_00069256                                                                                                                                                |                                                          |                                         |                                     |                   |            |     |
| Field of study                              | Civil Engineering                                                                                                                                            |                                                          |                                         |                                     |                   |            |     |
| Date of commencement of studies             | October 2023                                                                                                                                                 |                                                          | Academic year of realisation of subject |                                     | 2026/2027         |            |     |
| Education level                             | first-cycle studies                                                                                                                                          |                                                          | Subject group                           |                                     |                   |            |     |
| Mode of study                               | Full-time studies                                                                                                                                            |                                                          | Mode of delivery                        |                                     | at the university |            |     |
| Year of study                               | 4                                                                                                                                                            |                                                          | Language of instruction                 |                                     | Polish            |            |     |
| Semester of study                           | 7                                                                                                                                                            |                                                          | ECTS credits                            |                                     | 2.0               |            |     |
| Learning profile                            | general academic profile                                                                                                                                     |                                                          | Assessment form                         |                                     | assessment        |            |     |
| Conducting unit                             | Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering -> Faculties of Gdańsk University of Technology       |                                                          |                                         |                                     |                   |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor                                                                                                                                           |                                                          | prof. dr hab. inż. Lech Bałachowski     |                                     |                   |            |     |
|                                             | Teachers                                                                                                                                                     |                                                          |                                         |                                     |                   |            |     |
| Lesson types                                | Lesson type                                                                                                                                                  | Lecture                                                  | Tutorial                                | Laboratory                          | Project           | Seminar    | SUM |
|                                             | Number of study hours                                                                                                                                        | 15.0                                                     | 0.0                                     | 15.0                                | 0.0               | 0.0        | 30  |
|                                             | E-learning hours included: 0.0                                                                                                                               |                                                          |                                         |                                     |                   |            |     |
|                                             | eNauczanie source address: <a href="https://enauczanie.pg.edu.pl/2025/course/view.php?id=2311">https://enauczanie.pg.edu.pl/2025/course/view.php?id=2311</a> |                                                          |                                         |                                     |                   |            |     |
| 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                          | Knowledge of the interpretation of typical site investigation methods and soil laboratory tests, specially for off-shore applications                        |                                                          |                                         |                                     |                   |            |     |
|                                             | Application of in-situ test results in the design of piles                                                                                                   |                                                          |                                         |                                     |                   |            |     |

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| Learning outcomes                                              | Course outcome                                                                                                                                                                                                                                                                                                                                                                                                                                       | Subject outcome                                                                                                                | Method of verification                                                   |
|                                                                | [K6_W06] Demonstrates practical knowledge and understanding of materials, devices and tools, processes and technologies in the field of civil engineering (and their limitations).                                                                                                                                                                                                                                                                   | Student knows the impact of different technologies in foundation engineering on the environment.                               | [SW3] Assessment of knowledge contained in written work and projects     |
|                                                                | [K6_W07] Understand the investment's impact on the environment and the interrelationships and dependencies between the building structure and the natural environment                                                                                                                                                                                                                                                                                | Student knows the soil investigation methods and estimation methods of soil contamination.                                     | [SW1] Assessment of factual knowledge                                    |
|                                                                | [K6_U07] Design and build engineering structures in a sustainable manner, with care for the natural environment and a minimum carbon footprint                                                                                                                                                                                                                                                                                                       | Student is able to use efficiently various methods of soil improvement                                                         | [SU4] Assessment of ability to use methods and tools                     |
|                                                                | [K6_K01] Is aware of the key aspects of professional, ethical and social responsibility related to management, business operation, decision making and opinion formulation in civil engineering.                                                                                                                                                                                                                                                     | Student knows the impact of different technologies in foundation engineering on the environment.                               | [SK4] Assessment of communication skills, including language correctness |
|                                                                | [K6_U06] Conduct engineering activities in civil engineering subject area, using and applying practical knowledge and understanding of materials, equipment and tools, processes and technologies.                                                                                                                                                                                                                                                   | Student is able to interpret the results of static penetration tests.                                                          | [SU1] Assessment of task fulfilment                                      |
| Subject contents                                               | Course content – lecture<br><br>Interpretation of in-situ soil investigation using CPTU, DMT, vane test, pressuremeter and environmental probes. Off-shore soil investigation using CPTU, DMT, T-bar and piezoball. Interpretation of in-situ tests with the physical modelling tests. Application of soil investigation in foundation design and quality control of deep soil compaction. Sample quality and its impact on laboratory test results. |                                                                                                                                |                                                                          |
|                                                                | Course content – laboratory<br><br>Interpretation of soil profile and parameters from CPTU test. Application of CPTU method in direct and indirect foundation design (determination of pile bearing capacity). Macroscopic tests. Basic laboratory tests and their interpretation.                                                                                                                                                                   |                                                                                                                                |                                                                          |
| Prerequisites and co-requisites                                | Knowledge of bases of soil mechanics and foundation engineering                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                |                                                                          |
| Assessment methods and criteria                                | Subject passing criteria                                                                                                                                                                                                                                                                                                                                                                                                                             | Passing threshold                                                                                                              | Percentage of the final grade                                            |
|                                                                | lecture                                                                                                                                                                                                                                                                                                                                                                                                                                              | 50.0%                                                                                                                          | 50.0%                                                                    |
|                                                                | project                                                                                                                                                                                                                                                                                                                                                                                                                                              | 50.0%                                                                                                                          | 50.0%                                                                    |
| Recommended reading                                            | Basic literature                                                                                                                                                                                                                                                                                                                                                                                                                                     | Craig's Soil Mechanics by <a href="#">Jonathan Knappett</a> , <a href="#">Mr R F Craig</a> , CRC Press, 2019                   |                                                                          |
|                                                                | Supplementary literature                                                                                                                                                                                                                                                                                                                                                                                                                             | <a href="http://www.geologismiki.gr">www.geologismiki.gr</a><br><br><a href="http://www.geosoft.com.pl">www.geosoft.com.pl</a> |                                                                          |
|                                                                | eResources addresses                                                                                                                                                                                                                                                                                                                                                                                                                                 | Basic<br><a href="http://www.geosoft.com.pl">http://www.geosoft.com.pl</a> - Software to CPTU interpretation                   |                                                                          |
| Example issues/<br>example questions/<br>tasks being completed | Soil classification with CPTU<br><br>Determination of friction angle based on CPTU<br><br>Indexes from DMT tests                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                |                                                                          |

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| Practical activities within the subject | Not applicable |
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