GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00059158		
Field of study	Fundamentowanie		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	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	general academic profile	Assessment form	assessment
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Adam Krasiński	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	15.0	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

Acquiring basic knowledge in the field of construction and design of shallow and deep foundations and other selected geotechnical structures. Learning basic methods of calculating and designing foundations. Preparation for independent work as an environmental engineer.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U03] can prepare documentation regarding the implementation of an engineering task/project and prepare a text or presentation including a discussion of the results of the implementation	Is able to design simple shallow and deep foundations and sheet pile walls for general, sanitary and infrastructure construction. Is able to prepare documentation for the implementation of a simple engineering task/project in the field of foundations.	[SU1] Ocena realizacji zadania [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania
[K6_U06] knows and applies the basic provisions of construction law, water law and environmental law	Knows and applies the basic provisions of construction law, water law and environmental protection law in the area of foundations and selected geotechnical issues.	[SU2] Ocena umiejętności analizy informacji [SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU4] Ocena umiejętności korzystania z metod i narzędzi
[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	Has basic knowledge of soil mechanics, soil science, land reclamation and geotechnics and is able to use it in the field of foundations. Knows and applies the principles of sustainable development in foundations.	[SW2] Ocena wiedzy zawartej w prezentacji [SW3] Ocena wiedzy zawartej w opracowaniu tekstowym i projektowym
[K6_U16] can, when formulating and solving engineering tasks in environmental engineering, evaluate, select and apply appropriate methods and tools, recognize their non-technical aspects, including environmental, economic and legal aspects	In engineering tasks in environmental engineering, is able to evaluate, select and apply appropriate methods and solutions for the foundation of structures, taking into account environmental, legal and economic aspects.	[SU3] Ocena umiejętności wykorzystania wiedzy uzyskanej w ramach przedmiotu [SU4] Ocena umiejętności korzystania z metod i narzędzi [SU5] Ocena umiejętności zaprezentowania wyników realizacji zadania

<table>
<tr><td>Subject contents</td><td>Lectures1. Classification of soils and geotechnical categories of buildings.2. Field tests of soil subgrades3. Application and classification of shallow foundations4. Calculation and design of shallow foundations5. Pile foundations - application and types of construction technologies6. Basics of calculation of piles and pile foundations and load-bearing capacity tests7. Retaining structures and excavation lining - technologies8. Sheet piles - structures and basics of calculations9. Ground anchorages - structures and calculations10. Drainage of foundation excavations11. Ground improvements - technologies12. Use of geosynthetics in geotechnics and foundationsDesign1. Examples of calculation tasks for the design of shallow foundations2. Project 1 - direct foundation of an infrastructure facility - footing, strip or slab3. Examples of calculation tasks for the design of pile foundations4. Examples of calculation tasks for the design of sheet pile walls.5. Project 2 - cantilever or strutted sheet pile wall</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Completion of general level courses:- geoengineerings- basics of construction- building materials- general mechanics- technical drawing</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Colloquium of lectures</td><td>55.0%</td><td>40.0%</td></tr>
<tr><td>Passing 2 projects</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Activity during lectures</td><td>0.0%</td><td>10.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>1. Z. Wiłun: Zarys geotechniki WKŁ, Warszawa, 2004
2. E. Dembicki i inni: Fundamentowanie, t. I i II. Arkady, Warszawa 1988.
3. K. Biernatowski: Fundamentowanie. PWN, Warszawa 1984.
4. E. Motak: Fundamenty bezpośrednie. Wzory, tablice, przykłady. Arkady, Warszawa 1988.
5. K. Gwizdała: "Fundamenty palowe" Tom 1 i 2. PWN, Warszawa, 2011, 2013.
6. A. Krasiński: Teaching aids for the subject Foundations. e-Learning Platform PG</td></tr>
<tr><td>Supplementary literature</td><td>1. Puła O., Rybak C., Sarniak W.: Fundamentowanie. Projektowanie posadowień. DWE, Wrocław 1999
2. A. Jarominiak: Lekkie konstrukcje oporowe. WKŁ, Warszawa 2000.
3. Czasopisma: Inżynieria Morska i Geotechnika, Geinżynieria</td></tr>
<tr><td>eResources addresses</td><td>Basic
https://enauczanie.pg.edu.pl/moodle/ - A. Krasiński: Teaching aids for the subject Foundations.
Supplementary
https://imig.pl/ - Magazine: Inżynieria Morska i Geotechnika
https://inzynieria.com/czasopisma/wydania/gdmt - Magazine: Geoinżynieria</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Lectures:1. List and describe the types of soils and geotechnical categories of buildings.2. What is soil subgrade testing documentation and what basic elements should it consist of?3. What does drilling and probing of the soil subgrade involve?4. Sketch an example of a footing and foundation strip.5. Sketch the pressure distributions on the ground under the foundation strip for different values of the eB eccentricity.6. What are the differences in the construction technologies and applications of Vibro, SDP and CFA piles?7. The basic principle of calculating the pile capacity for compression and extraction.8. Draw approximate diagrams of bending moments in a sheet pile wall: a) cantilever, b) single-strut.9. What is the difference between soil replacement and vibroreplacement? (sketches)10. List the methods of strengthening the soil subgrade made of cohesive and organic soils and briefly describe two of them.11. Principle of operation of deep wells and wellpoints. When do we use one and when the other?12. Describe three selected types of synthetic materials and their application.Project:1. Calculate the load-bearing capacity of the soil subgrade under a direct foundation in conditions with and without water drainage from the ground.2. Calculate the settlement of the footing or strip foundation.3. Provide the procedure for calculating and designing a direct foundation.4. Calculate the value and distribution of soil and water pressure on the sheet pile wall.5. Calculate the required depth and bending of the sheet pile wall.6. Provide the procedure for calculating and designing a sheet pile wall</td></tr>
<tr><td>Practical activites within the subject</td><td>Not applicable</td></tr>
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