



Subject card

Subject name and code	, PG_00070543						
Field of study	Civil Engineering						
Date of commencement of studies	October 2022	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	4	Language of instruction			Polish		
Semester of study	8	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	dr hab. inż. Adam Krasieński					
	Teachers	dr hab. inż. Adam Krasieński dr inż. Rafał Ossowski					
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						
	eNauczenie source address: https://enauczenie.pg.edu.pl/2025/course/view.php?id=4884 Moodle ID: 4884 Fundamentowanie II - stac. 25_26 https://enauczenie.pg.edu.pl/2025/course/view.php?id=4884						
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	0.0		0.0	30	
Subject objectives	To provide students with expanded knowledge of the technology and principles of construction, calculation, and design of foundations and selected geotechnical structures. Discussion of slab and cofferdam foundations, deep foundations, primarily pile foundations, diaphragm and sheet pile walls, and other excavation support structures.						

Learning outcomes	Course outcome	Subject outcome	Method of verification
	[K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.	Conducts research (observations, measurements, numerical simulations and theoretical analyses) in the field of building foundations in order to solve specific tasks and report research results.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
	[K6_W03] Demonstrate knowledge and understanding of the processes, established standards and design methods in the civil engineering subject area and of their limitations.	Demonstrates knowledge and understanding of the processes and established standards and design methods for advanced building foundations and is aware of their limitations.	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects
	[K6_K04] Engages in independent lifelong learning and individually follows the development of science and technology in the field of civil engineering.	He engages in independent learning throughout his professional career and follows the development of science and technology in the field of building foundations.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice
	[K6_K03] Can effectively, clearly and unambiguously convey information, describe activities and communicate their results/ outcomes to engineers or a wider audience using appropriate communication methods and tools.	Is able to effectively and efficiently convey information, describe and explain the operation of building foundations and geotechnical structures to engineers or the general public using appropriate communication methods and tools.	[SK2] Assessment of progress of work [SK4] Assessment of communication skills, including language correctness [SK5] Assessment of ability to solve problems that arise in practice
	[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.	Is aware of the professional, ethical and social responsibility associated with management, conducting business, making decisions and formulating opinions in the area of building foundations and geotechnical works.	[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice [SK3] Assessment of ability to organize work
Subject contents	<p>Course content – lecture</p> <p>Geotechnics and Foundations Review. Calculation of foundations and geotechnical structures, taking into account their interaction with the soil medium. Extended approach to spread foundations - construction, calculation, and design. Extended approach to pile technologies. Calculation of the bearing capacity and Q-s characteristics of piles based on in-situ soil tests. A new approach to the static calculation of pile foundations. Extended approach to sheet pile walls and pile walls. Extended approach to diaphragm walls. Injected ground anchorages - technologies, applications, and research. Foundation in selected construction sectors: hydrotechnical, industrial, and infrastructure.</p> <hr/> <p>Course content – project</p> <p>Project 1 Calculation of a foundation slab on a heterogeneous soil Project 2 Calculation of a pile foundation using the generalized method and a new computational approach</p>		
Prerequisites and co-requisites	<p>Knowledge and skills in the following topics:</p> <ul style="list-style-type: none"> - soil mechanics - basic level - foundation engineering - structural mechanics - advanced level - reinforced concrete and steel structures - basic level 		

Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Lectures - colloquium	55.0%	40.0%
	Projects - credits	60.0%	50.0%
	Lectures - attendance	0.0%	10.0%
Recommended reading	Basic literature	<p>1. Gwizdała K.: "Pile foundations". Volumes 1 and 2, Warsaw, 2010, 2013, (In Polish).</p> <p>2. Kosecki M.: "Statics of pile systems". PZITB Branch in Szczecin, 2006, (In Polish).</p> <p>3. Motak E.: "Spread foundations. Formulas, tables, examples". Arkady, Warsaw, 1988, (In Polish).</p> <p>4. Jarominiak A.: "Light retaining structures". WKŁ, Warsaw, 2000, (In Polish).</p> <p>5. Krasieński A.: "Screw displacement piles. Interaction with non-cohesive subsoil". PG Publishing House, Gdańsk, 2013, (In Polish).</p>	
	Supplementary literature	<p>1. PN-EN 1997-1:2005. Eurocode 7: Geotechnical design Part 1: General rules.</p> <p>2. PN-EN 12699:2002. "Execution of special geotechnical works. Displacement piles."</p> <p>3. PN-EN 1536:2001. "Execution of special geotechnical works. Bored piles."</p> <p>4. Marine Engineering and Geotechnics - Journal</p> <p>5. Geoengineering Roads, Bridges, Tunnels - Journal</p>	
	eResources addresses		

<p>Example issues/ example questions/ tasks being completed</p>	<ol style="list-style-type: none"> 1. Models and parameters of soil-structure interaction elements. 2. Determining the stiffness of the soil beneath slab foundations. 3. Static calculation of slab foundations on elastic subsoil. 4. Static calculation of pile foundations using a generalized method and a new computational approach. 5. Screw displacement pile technology. 6. Problems of construction, calculation, and design of screw displacement piles. 7. Techniques for the construction and working mechanism of cement grouting under the bases of large-diameter bored piles. 8. Construction of steel tubular piles. 9. Methods for increasing the load-bearing capacity of open-ended steel tubular piles. 10. Complex sheet pile and pile wall systems. 11. Technology and application of diaphragm walls in construction. 12. Foundations for breakwaters, quays, and piers. 13. Foundations for weirs and hydrotechnical locks. 14. Foundations for power plants. 15. Foundations for transportation structures: bridges, viaducts, and embankments.
<p>Practical activities within the subject</p>	<p>Not applicable</p>

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