



Subject card

Subject name and code	, PG_00059100						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2024		Academic year of realisation of subject		2026/2027		
Education level	first-cycle studies		Subject group		Optional subject group		
Mode of study	Part-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 -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr Mariusz Wyroślak				
	Teachers						
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	0.0	0.0	5.0	0.0	15
	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	15		1.0		34.0	50
Subject objectives	1. Developing the ability to select and design shallow and deep foundations. 2. Becoming familiar with methods of soil investigation and the interpretation of their results. 3. Mastering the principles for assessing the bearing capacity and settlements of foundations in accordance with applicable standards (EUROCODE 7). 4. Developing practical competencies in geotechnical design.						

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	Knows the soil classification and the mechanical properties relevant to foundation engineering. Is able to select an appropriate type of foundation for the given soil and groundwater conditions. Is able to analyze geotechnical documentation and investigation reports.	[SU2] Assessment of ability to analyse information
	[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	Knows the principles of designing shallow and deep foundations according to PN-EN 1997. Knows the technologies used in foundation works and the principles of their quality control.	[SW3] Assessment of knowledge contained in written work and projects
	[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	Designs foundations with consideration of bearing capacity and settlements. Is able to analyze geotechnical documentation and investigation reports.	[SU1] Assessment of task fulfilment
	[K6_U06] knows and applies the basic provisions of construction law, water law and environmental law	Understands the professional responsibility of a geotechnical design engineer. Knows the principles of collaboration within a design team and how to communicate calculation results.	[SU1] Assessment of task fulfilment
Subject contents	Course content – lecture 1. Introduction to foundation engineering. 2. Soil investigation: field and laboratory methods. 3. Soil and groundwater conditions and classification of building subsoil. 4. Design principles in accordance with Eurocode 7. Safety principles for earthworks. 5. Shallow foundations: pads, strip footings, raft foundations. 6. Bearing capacity of soil limit states according to Eurocode 7. 7. Settlements calculation methods. 8. Deep foundations: piles, micropiles, DSM columns, jet grouting. 9. Special foundation solutions.		
	Course content – project • 1. Calculation of the bearing capacity and settlements of shallow foundations. 2. Compilation and documentation of design calculations. 3. Calculation of the bearing capacity of a single pile.		
Prerequisites and co-requisites	The student should have basic knowledge of: • soil mechanics, • geotechnics, • materials science, • building structures, • mathematics and physics.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
		50.0%	50.0%
		50.0%	50.0%

Recommended reading	Basic literature	1. Witun Z., Zarys geotechniki. 2. Pisarczyk S., Geotechnika fundamentowanie. 3. PN-EN 1997-1 and 1997-2 Eurocode 7: <i>Geotechnical Design</i>.
	Supplementary literature	1. Craig R.F., Mechanika gruntów. 2. Tomlinson & Woodward, Pile Design and Construction Practice. 3. Modern technics of foundations.
	eResources addresses	
Example issues/ example questions/ tasks being completed	1. How the geotechnical category of a structure is determined. 2. What a pile wall (palisade) is in foundation engineering. 3. Why shallow foundations should be placed below the frost penetration depth. 4. What is the difference between a foundation grillage and strip footings? 5. What displacement piles are. 6. Which technologies are classified as driven piles.	
Practical activities within the subject	Not applicable	

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