



## Subject card

Subject name and code	, PG_00048185						
Field of study	Civil Engineering						
Date of commencement of studies	October 2021		Academic year of realisation of subject		2023/2024		
Education level	first-cycle studies		Subject group		Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
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		4.0		
Learning profile	general academic profile		Assessment form		exam		
Conducting unit	Department of Geotechnics, Geology and Marine Civil Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Adam Krasieński				
	Teachers		dr inż. Paweł Więclawski  dr hab. inż. Adam Krasieński				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	5.0	0.0	10.0	0.0	30
	E-learning hours included: 0.0						
	Address on the e-learning platform: <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=15167">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=15167</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		7.0		63.0	100
Subject objectives	Knowledge and skills in the field of construction and design of the foundations of shallow and on piles. Knowledge of methods of foundation design and ground improvement. Preparation for independent work as an engineer and education at the second level of study.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_W08] knows the codes of modern geotechnical investigations and technologies, knows the principles of foundations and safe design of foundations of typical buildings		Student has knowledge of the field performance and design shallow and deep foundations; has skills of significant geotechnical problems identification.		[SW3] Assessment of knowledge contained in written work and projects [SW1] Assessment of factual knowledge		
	[K6_U09] can read architectural, geodetical and construction drawings, is able do prepare engineering drawing using selected CAD software		Student is able to make and read drawings of typical foundations and geotechnical constructions; can use the documentation of ground investigations.		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K6_K01] is aware of necessity of professional and personal competences improvement; complements and broadens his knowlege about modern processes and technologies		Student is aware of the need to raise qualifications and knowledge in the field of foundation and geotechnical engineering.		[SK2] Assessment of progress of work [SK5] Assessment of ability to solve problems that arise in practice		
	[K6_U07] Can design and properly dimension basic elements of construction or basic foundations of general, hydrotechnical and bridge constructions		Student is able to design typical shallow and pile foundations, retaining structures and sheet pile walls.		[SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		

Subject contents	LECTURE: Introduction to geotechnical design, geotechnical categories. The division and classification of foundations. Shallow foundations: strip, foot, grid, plate foundations. Ultimate limit states(ULS) and serviceability limit states (SLS). Retaining walls: types, principles calculations. Pile foundation: technologies, bearing capacity and settlement calculations, control methods. Determination of internal forces in the largesized and pile foundations systems. Sheet piling and diaphragm walls, technology, static scheme, calculations, anchorage. Construction of the shallow foundations, protection of excavations, drainage base of foundation excavations. EXERCISES: Determination of loads and static calculations of foundations and retaining structures. PROJECT: Retaining wall based on shallow or piles. Sheet piling once anchored.		
Prerequisites and co-requisites	Knowledge of the Soil Mechanics, Basic Mechanics, Building Materials		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Projects	60.0%	50.0%
	Activity at lectures	0.0%	10.0%
	Exam	55.0%	40.0%
Recommended reading	Basic literature	Wiłun Z.: Zarys geotechniki, WKŁ, Warszawa. Dembicki E. i inni: Fundamentowanie, t. I i II, Arkady, Warszawa 1988. Puła O., Rybak C.,Sarniak W.: Fundamentowani e. Projektowanie posadowień. DWE, Wrocław 1999. Motak E.: Fundamenty bezpośrednie. Wzory, tablice, przykłady. Arkady, Warszawa 1988. Jarominiak: Lekkie konstrukcje oporowe. WKŁ, Warszawa 2000. Kobiak J., Stachurski W.: Konstrukcje żelbetowe. Arkady, Warszawa 1989	
	Supplementary literature	PN-EN 1997-1:2008, Eurokod 7. Projektowanie geotechniczne. Zasady ogólne. Czasopisma: Inżynieria Morska i Geotechnika, Inżynieria i Budownictwo, Geoinżynieria i Tunelowanie"	
	eResources addresses	Podstawowe <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=15167">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=15167</a> - Materials and teaching aids for lectures and projects. Uzupełniające Adresy na platformie eNauczanie: Fundamentowanie - niestacjonarne - 23_24 - Moodle ID: 30336 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30336">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=30336</a>	
Example issues/ example questions/ tasks being completed	Types of soil conditions and geotechnical categories. Geotechnical documentation. Classification of shallow and deep foundations and retaining structures. Bearing capacity and settlement of subsoil under shallow foundations. Static calculation of retaining walls and sheet pile-walls. Pile technologies. Calculation and design of pile foundations. Methods for lowering the groundwater table. Methods of reinforcing the soil foundation and existing foundations. The use of geosynthetics in geotechnics and foundation technology.  Design a retaining wall.  Design a sheet piling.		
Work placement	Not applicable		