



## Subject card

Subject name and code	Advanced Foundations , PG_00049205						
Field of study	Civil Engineering						
Date of commencement of studies	October 2022		Academic year of realisation of subject		2022/2023		
Education level	second-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		blended-learning		
Year of study	1		Language of instruction		Polish		
Semester of study	1		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Faculty of Civil and Environmental Engineering						
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 and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	20.0	0.0	0.0	0.0	35
	E-learning hours included: 15.0						
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	35		5.0		60.0	100
Subject objectives	Acquisition of knowledge and skills in the field of construction and design of foundations for advanced and specialized building structures. Understanding modern methods of foundation design using computer methods. Acquisition of the ability to identify significant geotechnical problems. Preparation for independent work as an engineer in execution and design fields.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements		The student knows the principles of analysis, construction and dimensioning of complex geotechnical constructions and foundations of building structures.		[SW1] Assessment of factual knowledge		
	[K7_U14] is able to plan and to interpret the geotechnical investigations, to analyse the foundation stability; can design direct and deep foundations in complex soil conditions for complicated statical and dynamical loads		Student can interpret the results of geotechnical tests and use them in calculating and analyzing of geotechnical constructions and foundations of advanced building objects.		[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information		
	[K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry constructions and its details		Student can design shallow and deep foundations of advanced civil engineering structures.		[SU3] Assessment of ability to use knowledge gained from the subject [SU1] Assessment of task fulfilment		
Subject contents	Geotechnical design, geotechnical categories, methods of geotechnical design. Foundations of bridges and viaducts. Modern technologies and the solution of pile foundations. Advanced pile capacity tests. Housings of deep excavations and multi-storey underground of buildings. Raft and piled raft foundations. Foundation of high and heavy industrial buildings. Strengthening the subsoil under construction embankments.						

Prerequisites and co-requisites	Completion of courses: - soil mechanics - foundations - general mechanics - technical drawing - fundamentals of general construction, reinforced concrete and steel structures.		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Passing exercises	55.0%	45.0%
	Colloquium of lectures	55.0%	45.0%
	Activity at lectures	0.0%	10.0%
Recommended reading	Basic literature	1. Wiłun Z., Zarys geotechniki, WKŁ, Warszawa, 2004 2. Jarominiak A.: Lekkie konstrukcje oporowe, Warszawa, WKŁ, 2000 3. Gwizdała K., Fundamenty palowe. T1. 2011, T2. 2013, PWN Warszawa 4. M. Kosecki: Statyka ustrojów palowych. PZITB O/Szczecin, 2006. 5. Puła O., Rybak C., Sarniak W.: Fundamentowanie. Projektowanie posadowień. DWE, Wrocław 1999	
	Supplementary literature	1. Starosolski W., Konstrukcje żelbetowe, T2., PWN, Warszawa 1996 2. Normy polskie i Eurokod 7 3. Czasopisma: Inżynieria Morska i Geotechnika, "Geoinżynieria", Inżynieria i Budownictwo	
	eResources addresses	Adresy na platformie eNauczanie: Fundamenty Specjalne - Niestacjonarne - 22_23 - Moodle ID: 24004 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=24004">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=24004</a>	
Example issues/ example questions/ tasks being completed	Types of soil conditions and geotechnical categories. Generalized Winkler's ground substrate model. Calculation of foundation slabs on elastic soilbed. Determination of subsidence characteristics of a single pile and pile group The mechanism of the grouting action under the base of bored pile. Mechanism of cooperation of a pile-pile foundation with a ground substrate. The principle of deep excavation wall calculation.		
Work placement	Not applicable		