



## Subject card

Subject name and code	DEEP EXCAVATION, PG_00041191						
Field of study	Environmental Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			3.0		
Learning profile	general academic profile	Assessment form			assessment		
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 inż. Jakub Konkol				
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	15.0	0.0	0.0	0.0	45
	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	45		2.0		8.0	55
Subject objectives	Knowledge about types of deep excavation shoring systems and excavation shoring design. Understanding of geotechnical and environmental loads that acts on the excavation shoring.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
Subject contents	(1) Introduction and basics of deep excavation shoring design (2) Soldier pile wall (3) Secant pile wall (4) Sheet pile wall (5) Diaphragm wall (6) Ground anchors (7) Soil nailed walls (8) Selected seepage effects (9) Deep excavation - adjacent building interaction (10) The use of excavation shoring as permanent construction (walls of buildings) (11) Ecological aspects of deep excavations construction (12) Finite Element Method for deep excavations design (13) - (15) Excavation case study and Finite Element Method design example						
Prerequisites and co-requisites	Basic knowledge about (1) soil mechanics, (2) foundation engineering, (3) concrete structures, (4) steel structures, (5) modelling of engineering structures, (6) Strength of materials and (7) structural mechanics.						
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) Siemińska-Lewandowska, A. (2010). <i>Głębokie wykopy: projektowanie i wykonawstwo</i> . Wydawnictwa Komunikacji i Łączności. (2) Ou, C. Y. (2014). <i>Deep excavation: Theory and practice</i> . CRC Press. (3) Deutsche Gesellschaft für Geotechnik. (2013). <i>Recommendations on Excavations</i> . Wiley. (4) Gaba, A., Hardy, S., Doughty, L., Powrie, W., & Selemetas, D. (2017). <i>Guidance on embedded retaining wall design</i> . London, UK: Ciria.				
	Supplementary literature		(1) Ng, C. W., Simons, N., & Menzies, B. (2004). <i>A Short Course in Soil-Structure Engineering of Deep Foundations, Excavations and Tunnels</i> . Thomas Telford, London. (2) Puller, M. (2015). <i>Deep Excavation. A practical manual</i> . ICE Publishing. (3) Endicott, J. (2020). <i>Deep Excavations in Soil</i> . CRC Press.				
	eResources addresses		Adresy na platformie eNauczanie:				

Example issues/ example questions/ tasks being completed	1. Determination of the earth pressures on a rigid excavation shoring. 2. Determination of the earth pressure acting on excavation shoring from adjacent building 3. Define "sand boiling" conditions 4. Design a cap for secant pile wall / diaphragm wall 5. Determination the ground anchors length.
Work placement	Not applicable