



Subject card

Subject name and code	, PG_00062628						
Field of study	Civil Engineering						
Date of commencement of studies	October 2023		Academic year of realisation of subject		2024/2025		
Education level	first-cycle studies		Subject group				
Mode of study	Part-time studies		Mode of delivery		at the university		
Year of study	2		Language of instruction		Polish		
Semester of study	4		ECTS credits		4.0		
Learning profile	general academic profile		Assessment form		assessment		
Conducting unit	Department of Geotechnical and Hydraulic Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor		dr inż. Krzysztof Szarf				
	Teachers		dr inż. Krzysztof Szarf dr inż. Paweł Więclawski				
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	10.0	10.0	10.0	0.0	0.0	30
	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	30		0.0		0.0	30
Subject objectives	The aim of the class is to tech the students basics of soil mechanics						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_U02] Analyse & solve engineering issues & problems in the field of civil engineering by applying appropriate and relevant established analytical, numerical and experimental methods.		Student is able to solve exercises on geotechnics using analytical methods		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_W02] Demonstrate knowledge and understanding of the processes and established methods of analysis / solution of engineering issues & problems in the field of civil engineering and of their limitations.		Student is aware of the role of soil in the engineering tasks. Student is knowledgeable about geotechnical problems		[SW1] Assessment of factual knowledge		
	[K6_U05] Conducts research (obtaining information, simulations, experimental methods) in the field of construction in order to solve specific tasks and report research results.		Student knows how to perform basic testing of soil in a geotechnical lab in order to determine physical and mechanical characteristics of the soil. Student can evaluate lab results in the contexts of using soil as a building material.		[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools		
Subject contents	Lectures:1. Introduction to soil mechanics2. Water in soil3. Filtration. Freezing of soils4. Stresses in soil5. Compressibility of soil6. Strength of soils -- shear strength7. Bearing capacity of shallow foundations8. Consolidation9. Lateral stresses in soil: earth pressure10. Geotechnical failures. Soil reinforcement11. Stability of slopesLaboratory classes:1. Macroscopic tests on coarse soils and on fine soils2. Physical quantities of coarse soils3. State of coarse soils -- density index4. State of fine soils -- consistency limits5. Filtration6. Granulometric curve of a coarse soil7. Experiment with the Proctor apparatus8. Experiments with the oedometer9. Soil strength testing using the triaxial apparatus and the direct shear apparatusAUDITORIAL CLASSES: Physical properties of soil -- three phase system. Water flow through soil. Verticalstresses in soil. Soil strength. Lateral earth pressure						

Prerequisites and co-requisites	Basic knowledge of classical mechanics, mathematics, geology		
	Mathematics, especially mathematical analysis (integral and differential calculus)		
	Physics (mechanics), especially solid mechanics, hydraulics, elasticity theory		
	Geology, especially mineralogy, petrology and hydrogeology		
	Chemistry, especially physical chemistry and electrochemistry		
	Strength of materials		
	Polish proficiency		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	Laboratory classess - reports	100.0%	16.5%
	Laboratory classess - test	50.0%	16.5%
	Auditory classes - test	50.0%	33.0%
	Lecture - test	50.0%	34.0%
Recommended reading	Basic literature	Zenon Witun, Zarys geotechniki, WKiŁ 1982, 2013Tomasz JeŹ, www.tajnikigeotechniki.pl, Politechnika PoznańskaArnold Verruijt, Soil Mechanics, TU Delft, 2012	
	Supplementary literature	Norma PN-EN 1997-1:2004 Eurokod 7 Projektowanie geotechniczneNorma PN-EN-ISO 14688-1 Badania geotechniczne Oznaczanie i klasyfikowanie gruntu Część 1: Oznaczanie i opisNorma PN-EN-ISO 14688-2 Badania geotechniczne Oznaczanie i klasyfikowanie gruntu Część 2: Zasady klasyfikowaniaNorma PN-81/B-03020 Grunty budowlane. Posadowienie bezpośrednie budowli. Obliczenia statyczne i projektowanieNorma PN-86/B-02480 Grunty budowlane. Określenia, symbole, podział i opis gruntówNorma PN-88/B-04481 Grunty budowlane. Badanie próbek gruntu	
	eResources addresses	Podstawowe https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37691 - eNauczanie course Adresy na platformie eNauczanie:	
Example issues/ example questions/ tasks being completed	The entire class and all of its parts are given in Polish.LECTURES:Assessment based on a multiple choice test with negative points for the wrong answers. About 40 - 50questions, with 3 options each. Exemplary questions:1. Choose the cohesive soils:A) Sa B) FGr C) saclSi2. What is the typical value of the specific density of soil skeleton for a quartz sand?A) 2,65 g/cm^3 B) 1500 kg/m^3 C) 2,65 kN/m^3AUDITORIAL CLASSES:Passing based on a written test. The scope and the contents of the test are chosen by the auditorial classesteacher. Exemplary problems:1. Draw a vertical geostatic stress diagram for a geotechnical section given on a figure2. Given the values of soil skeleton specific density, bulk density and water content of soil calculate its voidratio3. Determine the internal friction angle value using the provided laboratory test dataLABORATORY CLASSES:The basic requirement is to perform and analyse the laboratory tests correctly and to write a report card(100% passing score). Moreover, if the laboratory classes teacher requires so, students shall write a test.Exemplary problems in the written test:1. Describe how to determine soil filtration coefficient2. Draw the triaxial cell. Show the stresses acting on the sample3. What are the Atterberg limits?		
Work placement	Not applicable		

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