GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Soil mechanics and soil science, PG_00059165		
Field of study	Environmental Engineering		
Date of commencement of studies	October 2024	Academic year of realisation of subject	2025/2026
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	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	3	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 -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Krzysztof Szarf	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	30.0	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	6.0	50.0	101

Subject objectives

The aim of the class is to tech the students basics of soil mechanics and soil classification.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_K01] can think and act in a creative and enterprising way; can set priorities for the implementation of an individual or group task; understands the need for continuous training and professional responsibility for their activities and team	Student is aware of the role of soil in the engineering tasks Student is able to work in the laboratory in a team	[SK3] Assessment of ability to organize work [SK2] Assessment of progress of work
[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	Student is able to solve exercises on geotechnics using analytical methods	[SU1] Assessment of task fulfilment
[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	Student learnt soil mechanics in the scope of the course Student learnt soil classification in the scope of the course Student is knowledgeable about geotechnical problems	[SW1] Assessment of factual knowledge

<table>
<tr><td>Subject contents</td><td>Lectures:1. Introduction to soil mechanics2. Water in soil3. Filtration. Freezing of soils4. Stresses in soil5. Compressability 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 apparatus</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>Basic knowledge of classical mechanics, mathematics, geology</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>test</td><td>45.0%</td><td>50.0%</td></tr>
<tr><td>laboratory work passed</td><td>100.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
<table>
<tr><td>Basic literature</td><td>Arnold Verruijt, Soil Mechanics, TU Delft, 2012</td></tr>
<tr><td>Supplementary literature</td><td>Braja M. Das, Fundamentals of Geotechnical Engineering, Cengage Learning, 2012</td></tr>
<tr><td>eResources addresses</td><td>Basic
https://enauczanie.pg.edu.pl/moodle/course/view.php?id=33426 - eNauczanie course (in Polish, winter semester 2023/2024)</td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Lectures:

Give a typical value of particle density of soil

Name the basic law describing the shear strength of soil

What quantities are used in Darcy's Law?

Laboratory:

To perform every test in the laboratory. Prepare a lab report for each test. Test.</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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