



## Subject card

Subject name and code	Soil mechanics and soil science, PG_00042879						
Field of study	Environmental Engineering						
Date of commencement of studies	October 2020	Academic year of realisation of subject			2021/2022		
Education level	first-cycle studies	Subject group			Obligatory subject group 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			2.0		
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. Krzysztof Szarf					
	Teachers	dr inż. Krzysztof Szarf dr inż. Witold Tisler mgr inż. Mateusz Wiszniewski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	15.0	0.0	0.0	30
	E-learning hours included: 0.0 Adresy na platformie eNauczanie: Mechanika Gruntów i Gruntoznawstwo - stacjonarne zima 2021/2022 - Moodle ID: 13589 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13589">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13589</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	5.0	20.0	55		
Subject objectives	The aim of the class is to teach the students basics of soil mechanics and soil classification.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[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					
	[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					

Subject contents	<p>Lectures:</p> <ol style="list-style-type: none"> <li>1. Introduction to soil mechanics</li> <li>2. Water in soil</li> <li>3. Filtration. Freezing of soils</li> <li>4. Stresses in soil</li> <li>5. Compressability of soil</li> <li>6. Strength of soils -- shear strength</li> <li>7. Bearing capacity of shallow foundations</li> <li>8. Consolidation</li> <li>9. Lateral stresses in soil: earth pressure</li> <li>10. Geotechnical failures. Soil reinforcement</li> <li>11. Stability of slopes</li> </ol> <p>Laboratory classes:</p> <ol style="list-style-type: none"> <li>1. Macroscopic tests on coarse soils and on fine soils</li> <li>2. Physical quantities of coarse soils</li> <li>3. State of coarse soils -- density index</li> <li>4. State of fine soils -- consistency limits</li> <li>5. Filtration</li> <li>6. Granulometric curve of a coarse soil</li> <li>7. Experiment with the Proctor apparatus</li> <li>8. Experiments with the oedometer</li> <li>9. Soil strength testing using the triaxial apparatus and the direct shear apparatus</li> </ol>											
Prerequisites and co-requisites	Basic knowledge of classical mechanics, mathematics, geology											
Assessment methods and criteria	<table border="1" data-bbox="448 817 1493 925"> <thead> <tr> <th data-bbox="448 817 794 857">Subject passing criteria</th> <th data-bbox="794 817 1141 857">Passing threshold</th> <th data-bbox="1141 817 1493 857">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 857 794 889">laboratory work passed</td> <td data-bbox="794 857 1141 889">100.0%</td> <td data-bbox="1141 857 1493 889">50.0%</td> </tr> <tr> <td data-bbox="448 889 794 925">test</td> <td data-bbox="794 889 1141 925">45.0%</td> <td data-bbox="1141 889 1493 925">50.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	laboratory work passed	100.0%	50.0%	test	45.0%	50.0%
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test	45.0%	50.0%										
Recommended reading	Basic literature	Arnold Verruijt, Soil Mechanics, TU Delft, 2012										
	Supplementary literature	Braja M. Das, Fundamentals of Geotechnical Engineering, Cengage Learning, 2012										
	eResources addresses	Mechanika Gruntów i Gruntoznawstwo - stacjonarne zima 2021/2022 - Moodle ID: 13589 <a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13589">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=13589</a>										
Example issues/ example questions/ tasks being completed	<p>Lectures:</p> <p>Give a typical value of particle density of soil</p> <p>Name the basic law describing the shear strength of soil</p> <p>What quantities are used in Darcy's Law?</p> <p>Laboratory:</p> <p>To perform every test in the laboratory. Prepare a lab report for each test. Test.</p>											
Work placement	Not applicable											