

COURSE DESCRIPTION CARD

Białystok University of Technology									
Field of study	Civil Engineering							Degree level and programme type	Bachelor's degree
Specialization/ diploma path								Study profile	academic
Course name	Soil Mechanics							Course code	EN-B1S51040
								Course type	obligatory
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	5
	30		30					No. of ECTS credits	5
Entry requirements	Mathematics, Engineering geology and petrography, Strength of materials								
Course objectives	Skill in subsoil identification and its evaluation for building and road foundation. Knowledge and ability to evaluate physical and mechanical parameters of the soil. Calculation of construction foundation settlement and stability of slopes.								
Course content	<p><u>Lecture:</u> Soil science elements. Soil properties. The study of physical and mechanical characteristics of soil. In situ tests. The mechanisms of soil failure. Hypotheses of strength. The flow of water in the soil. Filtration. Consolidation. Freeze elevation and breakthroughs. Slope Stability. Soil compaction. The stresses in the subsoil and the settlement of the building. Soil pressure and passive pressure.</p> <p><u>Laboratory classes:</u> Macroscopic evaluation and soil classification. Grain-size analysis including mechanical and hydrometer analysis. Determining density, dry density and specific gravity of the soil. Porosity and void ratio. Minimum and maximum void ratio. Density index. Determining plastic limit, plasticity index and liquid limit. Passive capillarity. Permeability test. Compaction test (moisture-density relation) and degree of compaction. Soil compressibility and consolidation test. Direct shear test.</p>								
Teaching methods	laboratory tests, teamwork								
Assessment method	lecture – written exam, laboratory classes – execution of the lab tests, evaluation of the reports, evaluation of the homework, two written tests								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
LO1	Student identifies physical and mechanical parameters of soil.							K_B1_W01, K_B1_W03, K_B1_U04, K_B1_U12	
LO2	Student describes water flow in soil and phenomena connected with it.							K_B1_U04, K_B1_U06	
LO3	Student estimates settlement of the building, stability of slopes and embankments.							K_B1_W03, K_B1_U02	

LO4	Students examines certain physical and mechanical parameters of soil.	K_B1_W03, K_B1_W04	
LO5	Student defines usability of soil as a building material for embankments.	K_B1_W04	
LO6	Student uses the Internet and other databases	K_B1_U12	
LO7	Student is able to work in a team.	K_B1_K02	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
LO1	Written exam, preparation for the lab classes	L, LC	
LO2	Written exam, preparation of the homework	L, LC	
LO3	Written exam, preparation of the homework	L, LC	
LO4	Execution of theoretical preparation for implementing exercises (first theoretical part of report) and writing research reports (second conclusive part of the report)	LC	
LO5	Correction and defence of the results of laboratory tests.	LC	
LO6	Written exam, assessment of the reports, two written tests.	L, LC	
LO7	Assessment of the in-class teamwork	LC	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	30	
	participation in classes, laboratory classes, etc.	30	
	preparation for classes, laboratory classes, projects, seminars, etc.	30	
	working on projects, reports, etc.	15	
	participation in student-teacher sessions related to the classes/seminar/project	5	
	implementation of project tasks	-	
	preparation for and participation in exams/tests	25	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		67	2,6
Student workload – practical activities		83	3,3
Basic references	1. Lancellotta R.: Geotechnical engineering. Balkema A.A./ Rotterdam / Brookfield, 1995. 2. Knapett J.A., Craig R.F.: Craig's soil mechanics. Spon Press, London and New York, 8th ed., 2012. 3. Powrie W.: Soil mechanics. Concept and applications. Crs Press, 3rd ed., 2014.		
Supplementary references	4. EN 1997-2:2004 Eurocode 7. 5. Atkinson J.H.: The mechanics of soils and foundations. Taylor and Francis, New York, 2007.		
Organisational unit conducting the course	Department of Geotechnics and Structural Mechanics	Date of issuing the programme	
Author of the programme	Assoc. Prof. Katarzyna Zabielska-Adamska, PhD, DSc, Eng	07.04.2020	

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work, S – seminar