

POLITECHNIKA KRAKOWSKA IM. TADEUSZA KOŚCIUSZKI

KARTA PRZEDMIOTU

obowiązuje studentów rozpoczynających studia w roku akademickim 2021/2022

Wydział Inżynierii Lądowej

Kierunek studiów: Budownictwo

Profil: Ogólnoakademicki

Forma studiów: stacjonarne

Kod kierunku: BUD

Stopień studiów: I

Specjalności: Bez specjalności – studia w języku angielskim

1 INFORMACJE O PRZEDMIOCIE

NAZWA PRZEDMIOTU	Mechanika gruntów
NAZWA PRZEDMIOTU W JĘZYKU ANGIELSKIM	Soil Mechanics
KOD PRZEDMIOTU	WIL BUD oIS C28 21/22
KATEGORIA PRZEDMIOTU	Przedmioty kierunkowe
LICZBA PUNKTÓW ECTS	3.00
SEMESTRY	4

2 RODZAJ ZAJĘĆ, LICZBA GODZIN W PLANIE STUDIÓW

SEMESTR	WYKŁAD	ĆWICZENIA AUDYTORYJNE	LABORATORIA	LABORATORIA KOMPUTERO- WE	PROJEKTY	SEMINARIUM
4	30	0	30	0	0	0

3 CELE PRZEDMIOTU

Cel 1 Introduction into the soil mechanics, the classification of soils. Macroscopic analysis.

Cel 2 Determination of physical parameters of soils: density, water content, porosity. Granulometric analysis.

Cel 3 Cohesive soil analysis, Atterberg limits, the degree of plasticity.

Cel 4 Non-cohesive soils problems, soil compaction, optimal water content.

Cel 5 Standard constitutive models of soil, mechanical properties, shear strength, soil compressibility. New constitutive models.

Cel 6 The water in the soil, filtration, filtration rate.

Cel 7 Soil as a multiphase medium: skeleton, fluid, gas. Hypotheses of strength and mechanisms of soil destruction. Introduction into the soil mechanics research problems.

4 WYMAGANIA WSTĘPNE W ZAKRESIE WIEDZY, UMIEJĘTNOŚCI I INNYCH KOMPETENCJI

1 First semester of Strength of Materials

2 Completing the course of Theoretical Mechanics

5 EFEKTY KSZTAŁCENIA

EK1 Wiedza Student gives the name of building soil with varying composition of the fractions, defines the physical characteristics of the soil and knows the granulometric analysis techniques.

EK2 Umiejętności Student is able to give the name of building soil on the basis of macroscopic diagnosis, is able to define the physical characteristics of the soil, perform sieve analysis and areometric analysis in the laboratory conditions.

EK3 Wiedza Student knows the Atterberg limits for cohesive soils, plasticity index and the density index for non-cohesion soils.

EK4 Umiejętności Student is able to define in laboratories the Atterberg limits, and the optimal density of the soil in Proctor tests.

EK5 Wiedza Student knows fundamental constitutive models of soils.

EK6 Umiejętności Student in the laboratory is able to find the cohesion and the internal friction angle in the direct shear test or in the triaxial compression test and compression modulus using oedometer.

EK7 Wiedza Student knows the hypothesis of soil strength.

EK8 Umiejętności Student, using the knowledge of the strength of materials, can explain the mechanisms of destruction of soil, as the three-phase materials.

EK9 Kompetencje społeczne Student is able to work individually and in a team, as well as report the results of work both for practical and scientific purposes.

6 TREŚCI PROGRAMOWE

LABORATORIA		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
L1	Classification of soils due to Polish and international standards. Basic concepts, symbols and description. Classes of soil samples and sampling methods.	4
L2	Granulometric analysis of the cohesive and non-cohesive soils.	4

LABORATORIA		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
L3	Determination of physical parameters of the soils. Determination of organic content.	4
L4	Atterberg limits.	4
L5	Soil compaction. Optimum moisture content and density index. Proctor method. Determination of hydraulic conductivity, Identification of passive capillary rise.	4
L6	Mechanical characteristics of the soil. Basic concepts. Compressibility and consolidation of soils, oedometer compressibility modules.	4
L7	The shear strength of a soil. Direct and residual shear tests. Determination of the internal friction angle and cohesion.	4
L8	Final approval of the reports. Final test.	2

WYKŁAD		
LP	TEMATYKA ZAJĘĆ OPIS SZCZEGÓŁOWY BLOKÓW TEMATYCZNYCH	LICZBA GODZIN
W1	Introduction into the soil mechanis. Soil classification of due to to Polish and international standards. Documentary collection and geotechnical categories of subgrade.	4
W2	The physical characteristics of soil: water content, density, porosity, other parameters. Granulometric analysis according to different standards,	4
W3	Atterberg limits for cohesive soils, the definition of plasticity index. Degree of compaction of cohesionless soil, hydraulic conductivity and passive capillary rise problems.	4
W4	Mechanical characteristics of the soil: the primary and secondary compressibility oedometer modules, the sand equivalent index.	4
W5	The shear strength in the direct shear test and triaxial compression test.	4
W6	The water and water pressure in the soil, aeration and saturation zone. Determine: suffosion, colmatage, consolidation, irrigation and dehydrations.	4
W7	Models of soil: a) as a linear-elastic halfspace, Boussinesq problem, b) multi-phase models, the main hypotheses in the theory of plasticity. Strain and stress soil models. Soil stability.	6

7 NARZĘDZIA DYDAKTYCZNE

N1 Lectures