**Nazwa przedmiotu:**

Soil Mechanics and Geotechnical Engineering II

**Koordynator przedmiotu:**

dr hab. inż Grzegorz Kacprzak, dr Rafał Kuszyk

**Status przedmiotu:**

Obowiązkowy

**Poziom kształcenia:**

Studia I stopnia

**Program:**

Civil Engineering

**Grupa przedmiotów:**

 Obligatory

**Kod przedmiotu:**

1080-BU000-ISA-0482

**Semestr nominalny:**

6 / rok ak. 2021/2022

**Liczba punktów ECTS:**

5

**Liczba godzin pracy studenta związanych z osiągnięciem efektów uczenia się:**

5 ECTS points - 125h:
30h lectures, 30h classes (exercises), 15h practice (in situ, in the laboratory), 10h report of practice, 15h independent execution of the projects, 5h consultation, 10h exam preparation, 10h preparation for exercise.

**Liczba punktów ECTS na zajęciach wymagających bezpośredniego udziału nauczycieli akademickich:**

3 ECTS points:

30h lectures, 30h classes (exercises), 15h practice (in situ, in the laboratory), 5h consultation, 2h exam.

**Język prowadzenia zajęć:**

angielski

**Liczba punktów ECTS, którą student uzyskuje w ramach zajęć o charakterze praktycznym:**

3 ECTS points:
30h classes (exercises), 15h practice (in situ, in the laboratory),
10h preparation for classes (exercises), 10h report of practice, 15h independent execution of the projects.

**Formy zajęć i ich wymiar w semestrze:**

|  |  |
| --- | --- |
| Wykład:  | 30h |
| Ćwiczenia:  | 0h |
| Laboratorium:  | 15h |
| Projekt:  | 30h |
| Lekcje komputerowe:  | 0h |

**Wymagania wstępne:**

Students must have passed examines in Engineering Geology.

**Limit liczby studentów:**

no limit

**Cel przedmiotu:**

Correct understanding and solving of the common geotechnical problems such as designing of shallow foundations, embankments, pile foundations, consolidation of soil beneth foundations and road embankments, retaining wall, veryfication of slope stability.

**Treści kształcenia:**

LECTURES Soil and Rock identification; Soil classification (including geotechnical categories); Nature, physical and mechanical properties of soil; Ground water - appearance and phenomenon connected with it; Bearing capacity of soils and foundations; Limit states; Stress distribution in the subsoil (total and effective streses); Theory of consolidations; Soil settlements.
PRACTICE IN LABORATORY: - macroscopic analysis, - soil moisture analysis; - sieve test; - hydrometer analysis; - bulk density analysis, particle density analysis; - consistency limits test; LS (ws) - shrinkage limit, PS (wp) - plastic limit, LL (wL) - liquid limit - Casagrande apparatus; - density index calculation; - permeability calculation, active capillarity calculation, passive capillarity calculation; - OMC optimum moisture content calculation - Proctor compaction device; - modulus of primary compressibility indication, modulus of secondary compressibility indication - oedometer test; - shear strength indication: direct shear apparatus - shear test box, triaxial apparatus.

**Metody oceny:**

Design practice and final test and examines.

**Egzamin:**

tak

**Literatura:**

[1] A. Jumikis; Soil mechanics; Edited by D. van Nostrand Company, INC. Princeton, New Jersey, 1962.
[2] Karl Terzaghi; From theory to practice in Soil Mechanics.
[3] Wiłun Z., Stażewski R. Soil Mechanics.

**Witryna www przedmiotu:**

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**Uwagi:**

## Charakterystyki przedmiotowe

### Profil ogólnoakademicki - wiedza

**Charakterystyka W1:**

The student should know the rules for determining the geotechnical conditions for foundation of buildings and other geotechnical construction; The student should know the basics of design process and analysis of typical civil engineering construction (general facilities, buildings, industrial, bridge and underground constructions).

Weryfikacja:

classes : self-made projects and practical test of designing, lectures : test of valid design rules.

**Powiązane charakterystyki kierunkowe:** K1\_W10, K1\_W06, K1\_W04, K1\_W13

**Powiązane charakterystyki obszarowe:** III.P6S\_WG, P6U\_W, I.P6S\_WG.o

### Profil ogólnoakademicki - umiejętności

**Charakterystyka U1:**

The student is able to design structures and foundations of buildings and geotechnical construction.

Weryfikacja:

classes : self-made projects and practical test of designing, lectures : test of valid design rules.

**Powiązane charakterystyki kierunkowe:** K1\_U03, K1\_U04, K1\_U07, K1\_U10

**Powiązane charakterystyki obszarowe:** P6U\_U, I.P6S\_UW.o, III.P6S\_UW.o

### Profil ogólnoakademicki - kompetencje społeczne

**Charakterystyka K1:**

The student can work independently and collaborate in a team of designated task, identify priorities for implementation of tasks; The student understands the importance of responsibility in engineering activities, including the accuracy of the results of their work and their interpretation.

Weryfikacja:

classes : self-made projects and practical test of designing, lectures : test of valid design rules.

**Powiązane charakterystyki kierunkowe:** K1\_K01, K1\_K06

**Powiązane charakterystyki obszarowe:** P6U\_K, I.P6S\_KR, I.P6S\_KO