



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Soil mechanics and foundation engineering [S1Bud1>MGiF1]

### Course

Field of study

Civil Engineering

Year/Semester

2/3

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

15

### Number of credit points

3,00

### Coordinators

dr Michalina Flieger-Szymańska

michalina.flieger-szymanska@put.poznan.pl

### Lecturers

### Prerequisites

**KNOWLEDGE:** Student beginning this course should have the basic knowledge in mathematics and physics and knowledge included in the first and second semester of building engineering studies. **SKILLS:** Student should be able to gather information from literature, databases and other properly selected information sources; should be able to synthesize the obtained information, interpret and evaluate it, as well as draw conclusions, formulate, discuss and justify opinions and positions. **SOCIAL COMPETENCIES:** Student should be able to work individually and together as a team over the designated task and be responsible for the accuracy of the results of their work and its interpretation.

### Course objective

Achieving the basic level of knowledge in soil mechanics, proper for the 1st cycle (BSc degree) studies in the field of Building Engineering.

### Course-related learning outcomes

**KNOWLEDGE:** Student:

1. Knows the basics of geology, have detailed knowledge in the field of soil mechanics and foundation engineering work.

2. Knows building legislation, Polish standards (PN) and European standards (EN), technical conditions of constructing building facilities, as well as basic ideas and rules in the field of intellectual and industrial property protection.

SKILLS: Student:

1. Is able to design and carry out simple lab experiments dedicated to evaluate the building material and engineering structure quality; is able to clearly present and interpret the results and draw conclusions;
2. Is able to gather information from literature, databases and other properly selected information sources;
3. Can synthesize the obtained information, interpret and evaluate it, as well as draw conclusions, formulate, discuss and justify opinions and positions.

SOCIAL COMPETENCES: Student:

1. Takes responsibility for the accuracy and reliability of work results and their interpretation.
2. Understands the need of team work, is responsible for the safety of their own work and team's work.
3. Is ready to critically evaluate the knowledge and received content, and critically evaluate the results of their own work.

## Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

- written test from lectures, laboratory and project classes,
- checking the current preparation and activity during classes,
- preparation of reports with the interpretation of the results of laboratory tests of soil characteristics from laboratory classes,
- execution of projects from project classes.

## Programme content

Engineering soil science. Soil mechanics. Foundations.

## Course topics

LECTURES:

- Genesis of the soils.
- Classification of soils.
- Physical characteristics and states of the soils.
- Water in the subsoil.
- Geotechnical characteristics of the soils.
- Shear strength of the soil.
- Compressibility and consolidation of the soils.
- Geostatic stresses in the subsoil.
- Active and passive pressure in soil substrate.
- Stability of the slopes.

LABORATORY CLASSES:

1. Soil classification and macroscopic testing of soils.
2. Analysis of granulometric composition. Grain size curves.
3. Physical characteristics of soils. Laboratory determination of leading parameters of soils.
4. Mechanical parameters of soils. Laboratory determination of compressibility and shear strength of soils.

PROJECTS:

1. Geostatic stresses in soils.
2. Passive and active pressure in the subsoil. Retaining walls.
3. Stability of slopes.

## Teaching methods

1. Lecture - multimedia presentations
2. Laboratory and project classes - multimedia presentations, performing laboratory tests, problem solving

## Bibliography

Basic:

1. Pisarczyk S.: Gruntoznawstwo inżynierskie, wydanie 2, Wyd. Naukowe PWN SA, Warszawa 2014.

2. Wiłun Z.: Zarys geotechniki, WKiŁ, Warszawa 2012.
3. Szymański A.: Mechanika gruntów, Wyd. SGGW, Warszawa 2007.
4. Dąbska A., Gołębiewska A.: Podstawy geotechniki. Zadania według Eurocodu 7, Oficyna Wydawnicza Politechniki Warszawskiej, 2019.

Additional:

1. Kostrzewski W.: Parametry geotechniczne gruntów budowlanych oraz metody ich oznaczania, wydanie 4, Wyd. PP, Poznań 2001.
2. Pisarczyk S.: Mechanika gruntów, Oficyna Wydawnicza PW, Warszawa 2005.
3. Myślińska E.: Laboratoryjne badania gruntów, wydanie 3, Wyd. Naukowe PWN SA, Warszawa 2001.
4. Obrycki M., Pisarczyk S.: Zbiór zadań z mechaniki gruntów, Oficyna Wydawnicza PW, Warszawa 2007.
5. Jeż J.: Biogeotechnika, Wyd. PP, Poznań 2008.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	90	3,00
Classes requiring direct contact with the teacher	45	1,50
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	1,50