# COURSE SYLLABUS SEMESTER FALL 2020/2021

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| Name of Course | Geotechnics 3. (Foundations) |
| **Course Code** | **MSB137AN-EA-00** |
| **Allotment of Hours per Week** | **2 lectures, 2 practice /week** |
| **Number of Credits** | **4** |
| **Program** | **B.Sc in Civil Engineering** |
| **Evaluation** | **Midterm- final exams, Homework and Project** |
| **Semester** | **7 th** |
| **Prerequisites** | **None** |
| **Department** | **Civil Engineering** |
| **Instructor** | **Ali Mohamed Mohamed Salem**  **Office: Boszorkány street 2 C0042**  **E-mail:** [**ali.salem@mik.pte.hu**](mailto:ali.salem@mik.pte.hu) |
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## OBJECTIVES

This course is aimed to provide basic and advanced knowledge on the principles and design of the different type of foundation. Topics covered by the course include: soil site explorations, bearing capacity of soil, shallow foundations, deep foundations, pile caps, soil improvement, Site Dewatering and supported deep excavation.

Students will gain from this course:

- knowledge of soil exploration and bearing capacity of soil,

- Understanding and Practical knowledge of foundation design.

- Knowledge of Ground improvement and supported deep excavation

## CONTENTS

**Short description:**

This course is aimed to provide basic and advanced knowledge on the principles and design of the different type of foundation. Topics covered by the course include: soil site explorations, bearing capacity of soil, shallow foundations, deep foundations, pile caps, soil improvement, Site Dewatering and supported deep excavation.

This course is designed to teach students how to calculate bearing capacity of soil for different site conditions. Explaining different techniques of soil site explorations. Explaining and discussing methods of designing different types of shallow foundations. Explaining and discussing methods of designing different types of deep foundations. Teaching student different methods of structural design pile caps. Teaching students different methods of soil improvement, Site Dewatering, and supported deep excavation.

**Methodology:**

- Lectures: will give the basis of soil exploration, bearing capacity of soil and geotechnical design of shallow foundation and deep foundation.

- Practical class: Practice the ability to design different types of foundation. Students will be assigned tasks to complete and carryout complete project design

- Exams: Accumulated knowledge is tested in two exams: a midterm and a final exam. Both feature multiple-choice, true-false or short essay questions.

**Schedule:**

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| **Week** | **Topic of lecture** |
| Week 1 | Introduction in Geotechnical Engineering |
| Week 2 | Soil investigation |
| Week 3 | Bearing capacity of soils |
| Week 4 | Design of shallow foundation(Strip footing+ Isolated footing) |
| Week 5 | Design of shallow foundation(Combined Footing) |
| Week 6 | Design of shallow foundation(Strap beam footing + Raft foundation) |
| Week 7 | **Mid-Term Exam** |
| Week 8 | Autumn break |
| Week 9 | Introduction to deep foundation (Piles material, size, load transfer, technology) |
| Week 10 | Design of pile (Single pile and pile group) |
| Week 11 | Design of pile cap |
| Week 12 | Ground improvement and soil reinforcement |
| Week 13 | Supported deep foundation + Site Dewatering |
| Week 14 | **Foundation** **Project Evaluation** |
| Week 15 | **Summary, Final Exam** |

## ATTENDANCE AND GRADING

**Attendance:**

Attending is required all classes, and will impact the grade (max. 10%). Unexcused absences will adversely affect the grade, and in case of absence from more than 30% of the total number of lesson will be grounds for failing the class. To be in class at the beginning time and stay until the scheduled end of the lesson is required, tardiness of more than 20 minutes will be counted as an absence. In the case of an illness or family emergency, the student must present a valid excuse, such as a doctor's note.

**Grading:**

10% - Attendance

15% - Homework

15%- Project

20%- Mid-Term Exam

40% - Final Exam

**Offered exam grade:**

Evaluation in percents Numeric grade

89%-100% 5

77%-88% 4

66%-76% 3

55%-65% 2

0-54% 1

**Students with Special Needs:**

Students with a disability and needs to request special accommodations, please, notify the Deans Office. Proper documentation of disability will be required. All attempts to provide an equal learning environment for all will be made.

## READINGS AND REFERENCE MATERIALS

- Joseph E. Bowles, McGraw-Hill 1996 “Foundation Analysis and Design”, 5th Ed.by .

- Braja M. Das Principles of Foundation Engineering, 4th Edition.

- Farkas, J., Józsa, V., Szendefy J. (2014): Foundation Engineering, elektronikus angol BSc egyetemi jegyzet, BME, Geotechnikai Tanszék p. 97.

- Holtz, R.D. and Kovacs, W.D. (1981): An Introduction to Geotechnical Engineering, Prentice Hall.

- Lecture notes and slides