# COURSE SYLLABUS SEMESTER FALL 2020/2021

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| Name of Course | Underground Structures |
| **Course Code** | **MSB384ANEP** |
| **Allotment of Hours per Week** | **2 lectures, 1 practice /week** |
| **Number of Credits** | **3** |
| **Program** | **B.Sc in Civil Engineering** |
| **Evaluation** | **Exam,Midterm, Homework and Presentation** |
| **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 of underground space and underground construction technologies, including planning, construction methods, safety, and environmental considerations.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 of underground space and underground construction technologies, including planning, construction methods, safety, and environmental considerations.

This course is designed to teach students geotechnical issues related to tunnelling and underground construction, particularly in urban areas. The fundamentals of tunnel design and the most common methodologies for tunnel construction are presented with the aid of documented case histories. Teaching students different methods of soil improvement, Site Dewatering, and supported deep excavation.

**Methodology:**

- Lectures: will give the basis of underground space and underground construction technologies.

- Practical class and lab practice: Students will be assigned tasks to complete

- 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 | Course description. Orientation. |
| Week 2 | Introduction in Tunnelling and Underground Construction Technology |
| Week 3 | Planning of Underground Construction Technology |
| Week 4 | Geotechnical Investigation for Tunnel Construction |
| Week 5 | Tunnel Construction Techniques, Shape and size of tunels |
| Week 6 | Stresses around Tunnels, Surface settlement calculation |
| Week 7 | **Mid-Term Exam** |
| Week 8 | .Autumn break |
| Week 9 | Principles of Tunnel Lining Design |
| Week 10 | Ventilation and lighting of tunnels |
| Week 11 | Monitoring and control in Tunnel Construction |
| Week 12 | Dewatering systems |
| Week 13 | Ground Movements, soil reinforcementand Supported deep foundation |
| Week 14 | Final exam. |
| Week 15 | Second exams (only if required). |

## 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

30% - Homework -Presentation

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

- D.Kolymbas, Tunnelling and Tunnel Mechanics, Springer

- D. Chapman et al., Introduction to Tunnel Construction, Spon Press

- Lecture notes and slides