

**General Information:**

Name of Course **(UNDERGROUND STRUCTURES)**

**Course Code:** PMTSTNB045CA-GY-01  
**Semester:** 6<sup>th</sup>  
**Number of Credits:** 4  
**Allotment of Hours per Week:** 2 Lectures/1 Practical Week  
**Evaluation:** Exam, Midterm, Homework, Presentation (semester mark)  
**Prerequisites:** None

**Instructor:** **Ali Mohamed Mohamed Salem**  
Office: Boszorkány street 2 B303  
E-mail: [ali.salem@mik.pte.hu](mailto:ali.salem@mik.pte.hu)

**General Course Description, Overall Aims of the Course:**

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.

**Learning Objectives:**

Students will gain from this course:

- knowledge of of underground space and underground construction technologies,
- Understanding and Practical knowledge of Tunelling design.
- Knowledge of Ground improvement and supported deep excavation.

**Methodology:**

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

**Schedule:**

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	<b>Mid-Term Exam</b>
Week 8	Principles of Tunnel Lining Design.
Week 9	Ventilation and lighting of tunnels
Week 10	Monitoring and control in Tunnel Construction

Week 11	Dewatering systems
Week 12	Ground improvement and soil reinforcement
Week 13	Ground Movements Supported deep foundation
Week 14	Final exam.
Week 15	Second exams (only if required).

**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

25% - Homework

25% - Mid-Term Exam

40% - Final Exam

Grade:	5	4	3	2	1
Evaluation in percents:	85%-100%	74%-84%	63%-73%	51%-62%	0-50%

**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:**

- Lecture notes and slides
- D.Kolymbas, Tunnelling and Tunnel Mechanics, Springer
- D. Chapman et al., Introduction to Tunnel Construction, Spon Press