Syllabus

Term: 2020/21/2 **Subject name:** Numerical Methods in Geotechnics **Subject code:** MSM141MLEP

Unit (Unit code)	(MIK-MS)
Lecturer responsible for the course:	Dr. JÓZSA Vendel
Requirement:	Mid-semester grade
Classes per week :	0/0/0/2
Classes per term:	0/0/0/14

Purpose of education:

Brief Syllabus: This course aims at teaching the basics of soil mechanics connecting to the geotechnical-numerical modelling and covers the following topics: mathematical models and computer programs, programming basic mechanism with excel, Finite Element Modelling (FEM).

This subject intends to provide students with knowledge in the basics of understand and program consolidation, settlements, bearing capacity of footings, equilibrium of gravity walls, embedded walls, bearing capacity of piles and anchorages. An additional objective is to prepare students with a basic knowledge for use Mohr-Coulomb,- Hardening-soil,- Soft-soil models and analyse geotechnical problems with FEM (e.g. sheet piles, retaining walls, slope stability).

Contents:

Learning Objectives:

Students will gain from this course:

- Knowledge of geotechnical modeling,
- Practical knowledge of mathematical models and computer programs.

Methodology:

- **Lectures**: will give the basis of Finite Element Modeling and Excel functions connecting to basic

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geotechnical problems.

- **Exam:** Accumulated knowledge is tested in one exam: midterm exam.

Schedule:

1. Course description. Orientation, Homework interpretation
2. Bearing capacity of shallow foundation, Excel functions
3. Basis of FEM
4. Geotechnical modelling, soil models
5. Geo5, Plaxis
6. Midterm Homework. presentation, Midterm exam
7. Midterm Homework. presentation, (supplementary) Midterm exam

System of examing and valuation:

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:

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System of examing and valuation:

10% - Attendance

40% - Midterm Homework

50% - Midterm Exam

Grade:	5	4	3	2	1
Evaluation in percents:	88%-100%	76%-87%	63%-75%	51%-62%	0-50%

Bibliography:

- http://www.plaxis.nl/plaxis2d/manuals/
- Presentations
- Czap, Z., Mahler, A., (2012): Geotechnical Numerical Methods, elektronikus angol MSc egyetemi jegyzet, BME, Geotechnikai Tanszék p. 97.