

## Numerical methods in geotechnics D, GEO-E2020

Tue 24<sup>th</sup> of Apr – Wed 31<sup>st</sup> of May 2023

Lectures Mon & Wed 10:15, R2, Civil Engineering Department		Exercises Tue & Thu 10:15, Maari E – 229, Maarintalo	
24.4	L1. Introduction & refresh: Finite Element Method for linear and non-linear materials	25.4	Introduction to the course. Introduction to geotechnical software available: Plaxis 2D, Optum G2. Shallow foundation design: bearing capacity with a variable water table
26.4	L2. Seepage and consolidation in Finite Element Method. Refresh of the Elasto-plastic constitutive models	27.4	Ex 1. Shallow foundation design: bearing capacity with a variable water table , soil-structure interaction, settlements
1.5	May Day	2.5	Ex 2a. Simplified embankment analysis
3.5	L3. Elasto-plastic constitutive models for soils available in FE software	4.5	Ex 2b: stability of a geotextile reinforced embankment. consolidation & factor of safety <b>Deadline exercise 1?</b>
8.5	L3. Elasto-plastic constitutive models for soils available in FE software	9.5	Ex 3. Deep excavations analysis <b>Deadline exercise 2?</b>
10.5	L4. Elasto-plastic constitutive models for soils available in FE software. Parameters estimation	11.5	Ex 3. Deep excavations analysis.
15.5	L5. Calculations with Finite Element Method: Finite Element Method limitations. Q&A before Exam 1.	16.5	Ex 4. Embankment analysis: Boston embankment with creep model <b>Deadline exercise 3?</b>
17.5	<b>Exam (L1-L5)</b> Design projects – distribution of subject, discussion, parameters estimation.	19.5 ?	Ex 4 / design projects.
22.5	Overview of exercises and lessons learnt. Case studies, see below.	23.5	Design projects <b>Deadline exercise 4?</b>
24.5	Case studies including Mexico City Cathedral and Barcelona Harbour	25.5	Design projects
		31.5	Design projects; Course summary/feedback <b>Design project presentations</b>

The schedule may change during the course, please follow MyCourses announcements. Note that if you do not present your design project on the required date it will likely mean you will not pass the course – **due to industrial involvement, once set, the deadline is non-extendable and non-alterable.**