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# Numerical methods in geotechnics D, GEO-E2020
**Tue 22nd of Apr – Fri 31st of May 2024**

| **Lectures, typically Mon & Wed 10:15, R2, Civil Engineering Department** | | **Exercises, typically Tue & Thu 10:15, Maari E – 229, Maarintalo** | |
|---|---|---|---|
| 22.4 | L1. Introduction & refresh: Finite Element Method for linear and non-linear materials | 23.4 | Introduction to the course. Introduction to geotechnical software available: Plaxis 2D, Optum G2. Shallow foundation design: bearing capacity with a variable water table |
| 24.4 | L2. Seepage and consolidation in Finite Element Method. Refresh of the elastoplastic constitutive models for soils | 25.4 | Ex 1. Shallow foundation design: bearing capacity with a variable water table, soil-structure interaction, settlements |
| 29.4 | L3. Elastoplastic constitutive models for soils available in FE software | 30.4 | Ex 2a. Simplified embankment analysis <span style="color:red">Deadline exercise 1</span> |
| **3.5 FRI** | L3. Elastoplastic constitutive models for soils available in FE software | 2.5 | Ex 2b: stability of a geotextile reinforced embankment. Consolidation & factor of safety |
| 6.5 | L4. Parameters estimation | 7.5 | Ex 3. Deep excavations analysis <span style="color:red">Deadline exercise 2</span> |
| 8.5 | L4. Parameters estimation | **10.5 FRI** | Ex 3. Deep excavations analysis. |
| 13.5 | L5. Calculations with Finite Element Method: Finite Element Method limitations. Q&A before Exam 1. | 14.5 | Ex 4. Embankment analysis: Boston embankment with creep model <span style="color:red">Deadline exercise 3</span> |
| 15.5 | **Exam (L1-L5)** Design projects – distribution of subject, discussion, parameters estimation. | 16.5 | Ex 4 / design projects. |
| 20.5 | Overview of exercises and lessons learnt. Case studies. Design projects | 21.5 | Design projects <span style="color:red">Deadline exercise 4</span> |
| 22.5 | Case studies including Mexico City Cathedral and Barcelona Harbour | 23.5 | Design projects |
| 29.5 | Case studies including Mexico City Cathedral and Barcelona Harbour Course summary/feedback | 30.5 | Design projects |
| **31.5 FRI** | **Design project presentations** | | |

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**.

Please note that we may be checking the reports for originality as well as AI use. We reserve the right to use any software we see fit for that purpose, including, but not limited to the TurnItIn software provided by Aalto University. Should we detect the AI use in the reports, without proper referencing, we may treat its use similar to plagiarism.