

**Finite Element Method in Geoengineering GEO-E1050 (draft schedule)**

<b>Week</b>	<b>Lectures – Rakentajanaukio 4</b> <b>Tue, 12:15, R5 265</b> <b>Thu, 10.15, R5 265</b>		<b>Exercises: Otakaari 1</b> <b>Wed &amp; Fri, 10:15, Y338</b>	
44	2.11	Introduction to the course & refreshing existing knowledge (tensors, coordinates, etc) Basic derivation of FEM	3.11	Introduction to the course, solving a linear elastic problem in Comsol
44	3.11 8.30 am		5.11	Solving a linear elastic problem in Optum G2 and Comsol
45	9.11	Basic derivation of FEM Convergence of FEM Some more advanced FEM subjects.	10.11	Introduction to Matlab
45	11.11		12.11	Solving a simple FEM problem in Matlab
46	16.11		17.11	Solving a simple FEM problem in Matlab
46	18.11	<b>Test 1 –FEM</b>	19.11	Finite Difference Method
47	23.11	Introduction to constitutive modelling Perfect Plasticity, Mohr-Coulomb, Hoek-Brown Perfect Plasticity, Mohr-Coulomb, Hoek-Brown	24.11	Shallow foundation in Optum and Comsol
47	25.11		26.11	Shallow foundation in Optum and Comsol
48	30.11		1.12	Tunnel excavations in Comsol & Optum G2
48	2.12	<b>Test 2 – Constitutive models &amp; Finite Difference Method</b> L: (Pitfalls of FEA)	3.12	Tunnel excavations in Comsol & Optum G2
49	7.12	Other numerical methods	8.12	Water flow in Comsol and Optum G2
49	9.12		10.12	Water flow in Comsol and Optum G2

Those who cannot attend the tests in the lecture hall will have an opportunity to pass them as oral exams over Zoom. Any corrections of the tests will be in oral over Zoom or in written/oral form at the department. Test 2 in the class takes less than 60 minutes, hence there is usually some time for a short lecture.

It is recommended for you to attend the course in person, though the lectures (and exercise introductions) will be recorded and streamed through Zoom (link:

<https://aalto.zoom.us/j/7791646359>, Meeting ID: 779 164 6359). Lectures in a colour coded blocks are given in a sequence, provided dates are approximate.

It is recommended (and required in case you are not attending the course on campus) that you install Matlab and Comsol (<https://download.aalto.fi/index-en.html>) and OptumG2

(<https://optumce.com>) on your personal computer. When the course starts, you will be given a more comprehensive license for OptumG2. For that you will need an account at Optum, hence **please register there for student's license with Aalto account.**

**The exercises will be taught by Tito Adibaskoro and Abhishek Gupta.**