

Finite Element Method in Geoenvironmental Engineering GEO-E1050 (draft schedule)

Week	Lectures Tue, 10:15, R2 Rakentajanaukio 4 Thu, 10.15, R1 Rakentajanaukio 4		Exercises: Otakaari 1, Y338 Wed 10:15 Fri 8:30	
43	24 Oct	Introduction to the course & refreshing existing knowledge (tensors, coordinates, etc) Basic derivation of FEM	25 Oct	Introduction to the course, solving a linear elastic problem in Comsol(HK, CR) Solving a linear elastic problem in Optum G2 and Comsol(HK, CR)
43	26 Oct		27 Oct	
44	31 Oct 8:30-12	Basic derivation of FEM Convergence of FEM Some more advanced FEM subjects. GEOTECHNICAL DAY	1 Nov	Introduction to Matlab (HK,CR) Solving a simple FEM problem in Matlab(AG,CR) Solving a simple FEM problem in Matlab(AG,CR,NS)
44	2 Nov		3 Nov	
45	7 Nov		8 Nov	
45	9 Nov	General Derivation of FEM Finite difference method	10 Nov	Finite Difference Method(AG,NS)
45	9 Nov	Test 1 –FEM	10 Nov	Finite Difference Method(AG,NS)
46	14 Nov	Introduction to constitutive modelling Perfect Plasticity, Mohr-Coulomb, Hoek-Brown Perfect Plasticity, Mohr-Coulomb, Hoek-Brown	15 Nov	Shallow foundation in Optum and Comsol(AG,NS) Shallow foundation in Optum and Comsol(AG,NS)
46	16 Nov		17 Nov	
47	21 Nov		22 Nov	Tunnel excavations in Comsol & Optum G2(AG,CR)
47	23 Nov	Test 2 – Constitutive models & Finite Difference Method L: (Pitfalls of FEA)	24 Nov	Tunnel excavations in Comsol & Optum G2(AG,NS)
48	28 Nov	Other numerical methods	29 Nov	Water flow in Comsol and Optum G2(HK,NS) Water flow in Comsol and Optum G2(HK,NS)
48	30 Dec		1 Dec	

It is recommended 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 at optumce.com for the student's license with your Aalto account.**

Most lectures will be recorded and shared among the participants only. The recordings will be incomplete (e.g. due to group work during the lecture etc.) and may be missing due to technical issues. Attendance in both lectures and exercises is highly recommended and will be recorded. The number of resit exams will be limited to 1 for those who do not attend the lectures.

The lecture scheduled on the 2nd of November is moved, as many students will attend the SGY organised Geotechnical Day

The exercises are taught by Abhishek Gupta (AG), Hakimeh Koochi (HK), Chenjie Ruan (CR) and Naum Shpata (NS)

The current schedule is a draft schedule, small changes are possible and likely. Please follow the MyCourses system and messages!