

GEO-E1040 ROCK EXCAVATION					
4.1.2022/ M Rinne					
Date	Weekday	Time	Week	Lecture contents	Lecturer
10.1.2022	Mon	10-12	2	Course introduction and Rock Engineering in Finland Tunneling and large UG rock caverns	M. Rinne
11.1.2022	Tue	12-15		Exercise 1 Introduction and some resources in net	J. Antikainen
12.1.2022	Wed	10-12		Surface excavation Mechanical rock excavation	M. Rinne
17.1.2022	Mon	10-12	3	Underground mining methods Underground mining methods	M. Rinne
18.11.2022	Tue	12-15		Tunnelling cost and timetable estimates Part I	J. Antikainen
19.1.2022	Wed	10-12		Shaft sinking and raise boring Loading and hauling surface excavation & UG	M. Rinne
24.1.2022	Mon	10-12	4	Explosives and detonators Explosives and detonators	T. Hänninen
25.1.2022	Tue	12-15		Ignition and blasting simulation. Classroom exercise	T. Hänninen
26.1.2022	Wed	10-12		Rock drilling theory Rock drilling applications	H. Räsänen
31.1.2022	Mon	10-12	5	Rock blasting theory: surface Rock blasting theory: underground	T. Hänninen
1.2.2022	Tue	12-15		Blasting exercise Blasting exercise	T. Hänninen
2.2.2022	Wed	10-12		Design of rock excavation works Rock excavation legislation and safety aspects	T. Hänninen
7.2.2022	Mon	10-12		Environmental impact of blasting: flyrock, vibration, air pressure wave, noise Environmental impact of excavation, crushing, traffic, nitrogen and watertable	T. Hänninen
8.2.2022	Tue	12-15	6	Tunnelling cost and timetable estimates Part II Tunnelling cost and timetable estimates Part II	J. Antikainen
9.2.2022	Wed	10-12		Rock Reinforcement and bolting Ventilation and dewatering	M. Rinne
14.2.2022	Mon	10-12	7	Injection grouting Sprayed concrete, mesh , scaling.	M. Rinne
15.2.2022	Tue	12-15		Ventilation	J. Antikainen
16.1.2022	Wed	10-12		Crushing and screening Crushing and screening	M. Rinne
22.2.2022	Tue	13-	8	EXAM	