

Questionnaire

Training Organisation	ETH Zurich
Country	Switzerland
First Name	Georgios
Last Name	Anagnostou
E-mail	georg.anagnostou@igt.baug.ethz.ch
Town	Zurich

Courses offered ^(*8)

Programme ¹	Course	Semester	Type ²	Hrs ³	CP ⁴	Syllabus
B-CE	Rock Mechanics	5	C	2	2	Introduction to the principles of rock mechanics. Fundamentals of engineering of structures built on rock: rock structure; description and behaviour of discontinuities; rock hydraulics; influence of water on deformations and stability; mechanical behaviour of intact rock; laboratory testing of rock; stability of rock foundations and slopes; field tests and measurements
B-CE	Underground Construction Fundamentals	6	C	2	3	Introduction to planning, design and mechanics of underground structures in rock or soft ground: Planning goals and boundary conditions; tunnel system; choice of alignment; design of the cross section; ventilation; typical phenomena, hazards and technical countermeasures; fundamentals of tunnel analysis; limit equilibrium models; analytical models; ground response curve and lining-ground interaction; face stability; loosening pressure: support design; properties of common support elements

¹ B-CE Bachelor programme in Civil Engineering
 M-CE Master programme in Civil Engineering
 B-ME Bachelor programme in Mining Engineering
 M-ME Master programme in Mining Engineering
 MAS Master of advanced studies

² C: compulsory
 E: elective

³ Number of teaching hours/week for lectures and exercises

⁴ Number of ECTS credit points (1 credit point = 30 hours student workload incl. homework)

ITA-CET
Committee on Education and Training
Activity Group 3: „University network“

B-CE	BSc Thesis	6	E(*1)	20	10	Rock mechanical design topic or research project
M-CE	Underground construction I	1	E(*6)	2	3	Basic aspects of design and analysis of underground structures. Conventional tunnel construction methods. Auxiliary measures (ground improvement and drainage, forepoling, face reinforcement). Numerical analysis methods.
M-CE	Underground construction II	2	E(*6)	2	3	Geotechnical aspects of mechanized tunnelling in soft ground or hard rock. Design & analysis for tunnelling through squeezing or swelling rock.
M-CE	Underground construction III	3	E(*6)	2	4	Selected topics: Caverns (Geometry, construction methods, support); Shafts (Construction methods, support); Ventilation during construction; Urban tunnelling (Boundary conditions, system choice, alignment, design); Field measurements (principles, monitoring layout, applications, interpretation); Cut and cover tunnels (analysis & design). Exercising conceptual solution of complex tunnelling problems based upon discussion of current tunnel cases with particularly demanding problems in small groups.
M-CE	Design thesis	2, 3	E(*2)	18	9	Design of an underground project
M-CE	MSc Thesis	4	E(*3)	47	24	Research project or design of an underground project
M-CE	Rock blasting techniques	2(*5)	E(*4)	3	2	Transfer of detailed knowledge of efficient blasting techniques for tunnel and open excavation under consideration of modern explosives and firing systems as well as aspects of health and safety.

Remarks:

- (*1) Thesis compulsory for B-CE, but topic elective
- (*2) Project compulsory for M-CE with major „Geotechnics“, but not necessarily in Tunnelling
- (*3) Thesis compulsory for M-CE, but topic elective
- (*4) Two-weeks block course
- (*6) Major in Geotechnical Engineering
- (*8) Only tunnelling related courses (without structural or other geotechnical engineering course)