A Short Course on

Engineering Geology, Rock Mechanics and Tunnelling

By Prof. Wulf Schubert & Prof. Kurt Klima
Graz University of Technology, Austria

12 – 16 November 2007
CEE Seminar Room A (BLK N1, B1b-06), NTU

Jointly Organised by
Society for Rock Mechanics & Engineering Geology
Defence Science & Technology Agency

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Synopsis: While this is intended as an introductory course on engineering geology, and rock tunnelling, it is also suitable for engineers and practitioners with some tunnelling experience but would like to upgrade their knowledge. It will cover both the fundamentals as well the practical engineering aspects of rock tunnelling, including rock mass classification, layout design, stability analysis, rock support design, instrumentation and monitoring, as well as site organisation and contractual and safety management for construction.

Registration Fee:

SRMEG Members: $1900.00
Non-SRMEG Members: $2000.00 (including a one-year membership with SRMEG).
(Registration fee covers course handouts, tea breaks and lunches)

Registration:

Title and Full Name (underline Surname / Family Name): Prof / Dr / Mr / Mrs / Ms*	Member of SRMEG: YES NO
Organisation: Address:	
Phone: (Office) (Mobile)	Fax:
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Method of Payment	

❑ By bank Draft / Cheque in Singapore Dollars drawn on a bank in Singapore and made payable to: "**Society for Rock Mechanics & Engineering Geology**"

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Please send registration and payment to:
Ms AN Xinmei, Blk N1.1, #B3-02, 50 Nanyang Avenue, Singapore, 639798
Tel: (65) 6790 6895 Fax: (65) 6790 6841 Email: anxi0001@ntu.edu.sg Website: www.srmeg.org.sg

Preliminary Program (12 – 16 Nov 2007, NTU)

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Monday, 12 November 2007		
9:00	Introduction	Course organization
9:30	Geology	Intact rocks: types, characteristics and classification; Discontinuities: genesis, types, classification, typical block shapes Intact rock-rock mass
12:30	Lunch break	
13:30	Rock Mechanics	Basic principles of continuum mechanics, stresses and deformation Friction, common failure criteria
16:00	Geology	Representation of discontinuities in the stereonet; practical application
17:00	End of lecture	

Tuesday, 13 November 2007		
9:00	Rock Mechanics	Properties of rocks and discontinuities, strength; influence of rock structure on strength and deformation, Determination of rock mass properties. Failure mechanisms in blocky rock masses, use of stereonet for stability assessment
12:30	Lunch break	
13:30	Geology	Investigation methods; field mapping, boreholes, borehole tests, geophysical methods, geological modelling
16:00	Geol/RM	Classification in rock mass types, criteria and practical application
17:00	End of lecture	

Wednesday, 14 November 2007		
9:00	Tunnelling	Influence of excavation on stresses and displacements Basic ground behaviour types
12:30	Lunch break	
13:30	Geology	Fault and fault zones
16:00	Tunnelling	Excavation and support methods; drill and blast and TBM; support methods, application and efficiency
17:00	End of lecture	

Thursday, 16 November 2007		
9:00	Tunnelling	Methods for analysis; closed form solutions, Finite Element and Finite Difference methods, Distinct Element method Criteria for application of different methods
10:00	Geology	Tunnel face mapping, investigation ahead of tunnel face, prediction of rock mass conditions into representative volume
12:30	Lunch break	
13:30	Tunnelling	Procedure of determination of excavation and support during excavation; Assessment of ground, assignment of excavation and support, prediction of system behaviour
16:00	Monitoring	Basic layout of monitoring program, common evaluation methods and plots
17:00	End of lecture	

Friday, 16 November 2007		
9:00	Tunnelling	Evaluation and interpretation of monitoring data, prediction of ground quality, advanced evaluation methods
12:30	Lunch break	
13:30	Tunnelling	Site organization, contractual aspects, safety management
16:00	End of course	

About the Lecturers

Wulf Schubert. Wulf has 30 years of professional experience in tunnelling. After working for GEOCONSULT mainly on tunnel projects around the world for more than 12 years, he was appointed full professor at the Graz University of Technology for Rock Mechanics and Tunnelling in 1992. His focus in research during the last 15 years was on tunnelling in poor ground. In this time he produced more than 100 publications. Parallel to the research and teaching, he has continued with consulting to keep up with the day to day problems, having been involved in design, construction supervision, and consulting for underground projects in Austria, Germany, Italy, Spain, Greece, Turkey, Iran, Slovenia, Korea, Taiwan, Thailand, Hong Kong, China, Nigeria, Pakistan, Venezuela, USA, Brasil, Argentina, Chile, Bolivia (total approx. 1.200 km tunnels). He is senior partner in the engineering company Gruppe Geotechnik Graz.

He has served as Vice President for the ISRM, is active in various working groups in the ISRM and ITA, and currently president of the Austrian Society for Geomechanics and editor of the journal FELSBAU.

Kurt Klima. Kurt was born in 1950 in Salzburg, and studied Geology at Graz University. He finished his studies with the degree of “Dr.phil.” in 1980. Since 1979 he has been with the Institute of Applied Geosciences at Graz University of Technology, and since 1992 in the position as Assistant Professor. The main fields of research are faults and the wide field of rock mass characterisation. Since 1999 he is Professional Engineer and senior partner in the 3G Gruppe Geotechnik Graz ZT GmbH geotechnical consulting company. Besides the research activities, Kurt Klima was involved in many tunnelling and hydropower projects in Austria and abroad (mainly in China and South America).