



Aalto University
School of Engineering

Short Course on
New Austrian Tunnelling Method
and
Observational Method

**TWO DAY COURSE FOR MINING ENGINEERS,
GEOLOGISTS AND ROCK ENGINEERS**



March 4-5, 2014

Espoo, Finland

Rak-50.4101 1.00 Cr ECTS
Postgraduate Course in Geoenvironmental Engineering

Introduction

The course introduces NATM and OM and covers the entire process from planning, design to construction. The course is a balanced combination of the fundamentals of engineering geology and rock mechanics with many practical engineering examples in varying geological conditions. This short course will prepare the participants with the necessary knowledge and skills to deal with real engineering problems with a view on managing geological risks.

Course Content

The course begins with an introduction to the geotechnical design flow. Intact rock characteristics, properties of discontinuities and representation of orientations will be explained. For rock mechanics, the determination of rock mass parameters and rock mass classification will be shown. The first day ends with geological investigation methods. On the first evening there is a Get Together dinner in Helsinki (self-pay).

The second day starts with the influence of excavation on stresses and displacements and continues with the geology of faults. Basic ground behaviour types are established and hazard identification and selection of excavation and support methods are introduced. At the end of the course there is a Sauna Evening in Otaniemi.

Who Should Attend the Course?

The course is aimed for rock engineers, geologists and students. University level background or extensive working experience are not required, but will certainly be helpful.

Lecturers



Prof. **Wulf Schubert** has 36 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 20 years has been on tunnelling in poor ground. He produced more than 200 publications and has continued with design, construction supervision, and consulting. He is senior partner in the engineering company Gruppe Geotechnik Graz. Prof. Wulf Schubert 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.



Prof. **Kurt Klima** 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 his research are on the 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. Additionally, he is involved in many tunnelling and hydropower projects.

Program

Tuesday, March 4th

08:30 Enrollment and Coffee

09:00 Introduction: Course organization

09:30 Tunnel design:

Basic geotechnical design work flow

10:30 Coffee Break

11:00 Geology: Intact rock types, characteristics and classification; Discontinuities: genesis, types, classification, typical block shapes Representation of discontinuities in the stereonet

13:00 Lunch break

14:00 Rock Mechanics: Determination of rock mass properties, influence of rock structure on strength and deformation Classification in rock mass types

15:30 Coffee Break

16:00 Geology: Investigation methods; field mapping, boreholes, borehole tests, geophysical methods, geological modelling

17:00 End of lecture day one

19:00 Get Together Dinner in Helsinki (self-pay)

Table Reservations: <http://www.vltava.fi>

Wednesday, March 5th

09:00 Tunnelling: Influence of excavation on stresses and displacements

10:30 Coffee Break

11:00 Geology: Faults and fault zones

13:00 Lunch break

14:00 Tunnelling: Basic ground behaviour types Hazard identification and selection of excavation and support methods based on ground behavior

15:30 Coffee Break

16:00 Monitoring: Monitoring methods Monitoring data interpretation

17:00 Sauna Evening in Otaniemi (included)

Sponsor speakers, Tieto-sauna, Otaranta

Registration

Price for **early bird** enrolment before **February 4th**:
(Price for late enrolment in parenthesis)

- Aalto University students are free of charge¹
- Other university students **100 €** (150 €)²
- Others **300 €** (350 €)³

10% discount to members of ISRM or EAGE.

- ¹ Lunch not included, coffee/tea not included.
- ² Lunch not included, coffee/tea included. Limited amount of academic free admittances available: to apply, send an application (max. 1 A4 paper) to Mikael.Rinne@aalto.fi before February 4th.
- ³ Lunch included, coffee/tea included.

Note! Only online payment is accepted. No invoices will be sent. Receipts will be provided.

Register before **February 18th** using the link:

[>> REGISTRATION FORM <<](#)

Accommodation

Participants arrange their own accommodation:

Radisson Blu Hotel Espoo is located ½ km from the Aalto campus. www.radissonblu.fi

Sokos Hotel Tapiola Garden is located 2 km from the Aalto campus, with good public transport connections. www.sokoshotels.fi

Eurohostel is a hostel offering single room accommodation located centrally in Helsinki, 11 km from the Aalto campus. www.eurohostel.com

Academic Credit

Participants with study right in Aalto University may receive 1.00 Cr ECTS with attending all the lectures, submitting the feedback form and writing a 300 or more words student journal.

Everyone will receive a course certificate with short description of course content and extent.

Course Venue

Auditorium (1st floor)

Dipoli Congress Centre <http://www.dipoli.fi>

Aalto University

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