UNIVERSITY CERTIFICATE PROGRAMME
Academic NATM Engineer

MONTAN UNIVERSITÄT
WWW.UNILEOBEN.AC.AT

TU Graz
Graz University of Technology

NATM Engineer

New Austrian Tunnelling Method

www.natm.at

Background and aim of the Course

The continuously increasing worldwide demand for qualified tunnel engineers cannot be covered by the standard education at universities.
The University Course aims at increasing the skills of the participants in the fields of geotechnical engineering and tunnelling, with an emphasis on the “New Austrian Tunnelling Method” (NATM).
The degree holders shall be enabled to accomplish tunnelling projects on their own in the face of geotechnical, structural, organizational, contractual and economic needs according to the latest state of the art.

Duration and Organization

The University Course lasts 4 semesters and is valid 61 ECTS-Credits.
The University Course will be held in 4 modules lasting three weeks each, allowing participation parallel to the job.

Schedule

Module 1: April 14th, 2009 to April 30th, 2009, held in Leoben
Module 2: Sept. 14th, 2009 to Oct. 2nd, 2009, held in Graz
Module 3: April 6th, 2010 to April 23rd, 2010, held in Leoben
Module 4: Sept. 13th, 2010 to Oct. 1st, 2010, held in Graz

Participants and Career

The University Course addresses civil engineers, geotechnical engineers and engineering geologists who do have a distinctive technical education and aim at a specialization in tunnelling.
Future fields of work may be planning, design and consulting of underground projects for engineering offices, or construction management for contractors and owners.

Certificate

Successful participants are awarded the title "Academic NATM engineer".

Teaching Method and Language

The teaching method is teacher-centred to mediate the necessary skills. Practical training on construction sites will round off the University Course. Participants are encouraged to develop and realize projects in team work.
All courses will be taught in English.

Application and Admission

Applicants who fulfil one of the following requirements qualify for the University Course:

- a master degree from a technical university in a related field
- a bachelor degree from a technical university in a related field and a minimum of 3 years of professional experience
- a degree from a technical college and minimum 5 years of professional experience

A good command of English language is obligatory.
Applicants have to send in the completed registration form (see www.natm.at), a CV and copies of degrees.
Admission is based on the review of the applications and if required on interviews with the candidates or a test.
The term of application ends on January 31st, 2009!

Attendance fee

12.000 Euro (3000 Euro per module)

Courses

Introduction to the "New Austrian Tunnelling Method"

Aim: Fundamental knowledge of the modern tunnel construction methods, knowledge of the observational method, its fundamentals and practical application.

Course type: Lecture | Lecturer: Schubert | ECTS-Credits: 0,75

Investigation and Engineering Geological methods

Aim: Ability to develop project-related exploration programmes, to define the objects of the exploration, ability to identify benefits and limits of each investigation method.

Course type: Lecture | Lecturers: Kieffer, Schubert, Galler | ECTS-Credits: 3,0

Rock mechanical laboratory testing

Aim: Comprehension of laboratory methods, the ability to interpret laboratory results critically and to properly use the parameters in the design.

Course type: Lecture | Lecturers: Blümel, Pittino | ECTS-Credits: 2,0

Rock Mass Characterization and Classification

Aim: Ability to critically apply classification methods; ability to develop basics and input parameters for the modelling of rock mass.

Course type: Lecture | Lecturers: Galler, Kieffer, Schubert | ECTS-Credits: 3,5

Geotechnical design

Aim: Ability to perform geotechnical design from the evaluation of exploration results to structural design.

Course type: Lecture, exercise | Lecturers: Schubert, Galler, Kieffer | ECTS-Credits: 10,5

Risk Analysis

Aim: Ability to identify and quantify hazards in NATM tunnelling; ability to execute a risk analysis; ability to conduct corridor assessment and route selection.

Course type: Lecture | Lecturers: Schubert, Galler | ECTS-Credits: 4,0

Tunnel Layout

Aim: Ability to design tunnel profile and construction sequences.

Course type: Lecture | Lecturer: Galler | ECTS-Credits: 6,0

Numerical Analysis

Aim: Ability to use numerical simulation programmes and interpret the results.

Course type: Lecture, exercise Lecturers: Schweiger, Schubert, Galler, Pittino ECTS-Credits: 4,5

Construction contract

Aim: Ability of independent development of a construction contract model for NATM-tunnels. Good knowledge of the rights and duties of contractors and clients.

Course type: Lecture Lecturer: Haberland ECTS-Credits: 1,5

Site organization, construction management

Aim: Knowledge of the most important aspects of construction management, operation economic fundamentals of NATM tunnelling, including tunnel safety (from aerodynamics to drainage).

Course type: Lecture Lecturers: Haberland, Galler ECTS-Credits: 3,0

Tunnelling safety

Aim: Ability to establish, implement and monitor safety and health protection concept.

Course type: Lecture Lecturer: Galler ECTS-Credits: 1,5

Monitoring, data evaluation and interpretation

Aim:Ability to merge geological, geotechnical data and measurement data to a geotechnical model; ability to judge whether behaviour is normal; interpretation of deviations from normal behaviour, prediction of rock mass quality based on displacement trends.

Course type: Lecture, exercise Lecturer: Schubert ECTS-Credits: 3,75

Instrumentation

Aim: Ability to work with monitoring instruments of measurements and to evaluate monitoring results.

Course type: Lecture, exercise Lecturers: Rabensteiner, Golser, Galler ECTS-Credits: 3,0

Preparation of a thesis is mandatory. A final exam concludes the course.

Lecturers

The majority of the lectures will be held by the professors Galler, Schubert, Kieffer and Schweiger. In addition lecturers with academic background and from industry will contribute to special issues.

O.Univ.-Prof. DI Dr.mont. Wulf Schubert
Head of the Institute of Rock Mechanics and Tunnelling, Graz University of Technology
Worked with GEOCONSULT, Consulting Engineers, as Senior Engineer and Consultant for 12 years

Univ.-Prof. DI Dr.mont. Robert Galler
Head of the Institute of Subsurface Engineering, Department of Mineral Resources and Petroleum Engineering, Leoben University of Mining
Worked with GEOCONSULT, Consulting Engineers

Univ.-Prof. D. Scott Kieffer
Head of the Institute of Applied Geosciences, Graz University of Technology
Geologist and independent consultant
Worked with Jacobs Associates, San Francisco
Worked as associate Professor at Colorado School of Mines

Ao.Univ.-Prof. DI Dr.techn. Helmut Schweiger
Ao.Univ.-Prof. at the Institute for Soil Mechanics and Foundation Engineering,
Graz University of Technology
Head of the Working Group Numerical Geotechnics

In addition:

Ass.-Prof. Dr.phil. Kurt Klima
Ass.-Prof. at the Institute of Applied Geoscience, Graz University of Technology

Ass.-Prof. DI Dr.techn. Manfred Blümel
Ass.-Prof. at the Institute of Rock Mechanics and Tunnelling, Graz University of Technology

DI Dr.mont. Gerhard Pittino
Lecturer at the Institute for Subsurface Engineering, Department of Mineral Resources and Petroleum Engineering, University of Mining Leoben
Head of the laboratory of the Institute of Subsurface Engineering, Leoben University of Mining

DI Klaus Rabensteiner
Head of the management of Geodata ZT GmbH, Leoben
Lecturer at the Institute of Geomechanics and Tunnelling at the University of Mining Leoben

DI Johann Golser
Manager of Geodata Messtechnik GmbH, Leoben

DI Christoph Haberland
Construction and Project manager of several construction sites of tunnelling of PORR Tunnelbau GmbH
Since 2007 department manager of the MOE-region for PORR Tunnelbau GmbH

Organization, Transport & Accomodation

The University Course will take place in Graz and Leoben. Both cities are university cities with a large number of students and a vital everyday life. Graz has got an international airport and a train station. Leoben can be easily reached by train in one hour from Graz.
For students from abroad, we can assist in finding the adequate accommodation. There are a number of dormatories and guesthouses in Graz and Leoben, where one can stay for a longer period at a reasonable price.
If you need any assistance or have additional questions, do not hesitate to contact:

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