TNO DIANA BV is pleased to invite you to a free training course on 3D Finite Element Analysis for Geotechnical & Tunnel Engineering. The course will be held on 12-13 March 2009. The training course consists of a balanced mixture of lectures and hands-on computer analyses with midasGTS finite element software. Modelling strategies will be discussed and personalised advice will be provided on a one-to-one basis.

**Course Description**

**Benefits**
- The course focuses on the application of the finite element method in geotechnical and tunnel engineering. The lectures will be followed by exercises to provide participants with hands-on experience.
- The course will be oriented on 3D modeling concepts and handling of complex geometries such as tunnel intersections.
- Gain insight in the workings of finite elements and get started with midasGTS graphical user interface.
- Learn good-practice in finite element modeling and gain skills in 2D and 3D model building.

**Who should attend**

The course is aimed for practicing engineers or academics who wish to learn more about 3D finite element analysis techniques using midasGTS. The course content will be relevant to current and potential users of finite element software and engineers involved in consultancy services.

**Software:**

Exercises and case studies are based on the software midasGTS, the 2D and 3D finite element package. This new generation program has been designed for the deformation and stability analyses of underground works and geotechnical structures. Its intuitive and highly interactive graphical interface allows 3D finite element modelling of general geotechnical applications including tunnels, (deep) foundations, excavation, and slope stability problems. The analysis capabilities encompass construction stages, soil-structure interaction, slope stability, seepage/consolidation, vibration, and earthquakes with more than 10 geotechnical oriented constitutive material models for both soil and rock.

**Format**

- Timing for the course both days: 9.00am - 5.30pm
- Participants are expected to take their own laptop.
- A full trial version of the midasGTS software latest version, valid for 30 days, will be provided to all participants for use during the course and afterwards.
Registration Form

Please complete and return this form to:
Jantine van Steenbergen, TNO DIANA BV,
Schoemakerstraat 97, 2628 VK, Delft, Netherlands
fax: +31 15 276 3019  email: courses@tnodiana.com
Confirm attendance days:  [ ] 12 March, day 1  [ ] 13 March, day 2

Surname: .................................................................
Title: (Mr/Ms) ...................................................... First name: .................................................................
Job title: ........................................................................................................................................
Organisation: ...................................................................................................................................
Address: ...........................................................................................................................................
Postcode: ................................................................. Country: .................................................................
Tel: ................................................................................................ Fax: ..............................................................
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Availability of own laptop? ....................................................................................................................

Note: Please complete separate forms for each delegate. Photocopies of this form are acceptable.

Outline Agenda

12 March
• Introduction to FE based Geotechnical Analysis
• Good-practice in finite element modelling
• Introduction to material modelling and parameter assessment
• Drained and undrained static analysis
• Assessment of factor of safety by c-phi reduction method
• 2D modelling exercises (shallow foundation benchmark)

13 March
• 3D geometrical modelling concepts
• Advanced 3D meshing algorithms and mesh generation
• Construction stage analysis
• A to Z for 3D model building, analysis, and processing of results using representative case studies (Tunnel and deep foundations)

About the Instructors

Dr. Ahmed Elkadi received his PhD and MSc in Civil Engineering from Delft University of Technology, Delft, Netherlands. He obtained his engineering degree from Ain Shams Uni., Egypt. He has over 13 years of experience in both research and consultancy in the field of geotechnical and civil engineering. He works with TNO DIANA since 2005 and is midasGTS team-leader.

Dr. Maziar Partovi received his PhD and MRes in Civil and Mechanical Engineering from Swansea University, Wales, UK. He obtained his engineering degree from Tehran, Iran. He has almost 10 years of research and consultancy experience in the field of finite element modeling in civil engineering.