

Short Course:

Hazard Assessment for 2D/3D Slope Stability Analysis Considering Atmospheric Conditions

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Guest Lecturer: Professor Yufeng Gao, Ph.D., HoHai University

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Modern trends in slope stability analysis have emerged from the need to better evaluate problems subjected to complex geometries, soil-atmosphere boundary conditions and uncertainty associated with geotechnical parameters. This short-course focuses on examining the latest numerical techniques in analyzing the impact of atmospheric conditions to slope stability problems. The morning session will focus on methodologies for the construction of conceptual geometry models. Approaches for quickly extracting 2-D cross-sections or full 3-D numerical models will also be covered. More advanced approaches, such as the shear strength reduction technique, will be discussed and demonstrated. Different approaches will be discussed and presented for the analysis of groundwater considering unsaturated/saturated seepage, precipitation, infiltration and runoff. Both design precipitation events and long time series will be considered. The determination of critical slip surfaces in Limit Equilibrium analyses will be discussed, including the use of optimization techniques that allow the determination of shallow failure mechanisms often associated with severe precipitation events. The use of hundreds or thousands of 2D or 3D analysis in the Multi-Plane Analysis (MPA) method to analyze slope stability factors of safety over large land regions will be covered. Development of risk maps using the latest semi-automated techniques will be covered. The importance of combining risk-based analysis with traditional limit equilibrium methods of slope stability analysis will be presented.

COURSE DETAILED OVERVIEW

Morning Session

- Theory: Trends in theory & development of slope stability analysis: unsaturated soil-atmosphere modelling and probabilistic analyses
- Tutorial: Conceptual model design and management of complex geometries
- Tutorial: Modelling transient unsaturated ground water flow considering complex atmospheric conditions
- Tutorial: Probabilistic modelling and sensitivity analysis

Afternoon Session

- Theory: Trends in theory & development of slope stability analysis: advanced search methods for critical slip surfaces and the shear strength reduction technique
- Training: Example of application of optimization technique to critical slip surface search
- Training: Analysis of 2D/3D slopes using the Shear Strength Reduction (SSR) method
- Application: Use of the MPA method for risk-based analysis over geographical areas

IMPORTANT COURSE REQUIREMENTS

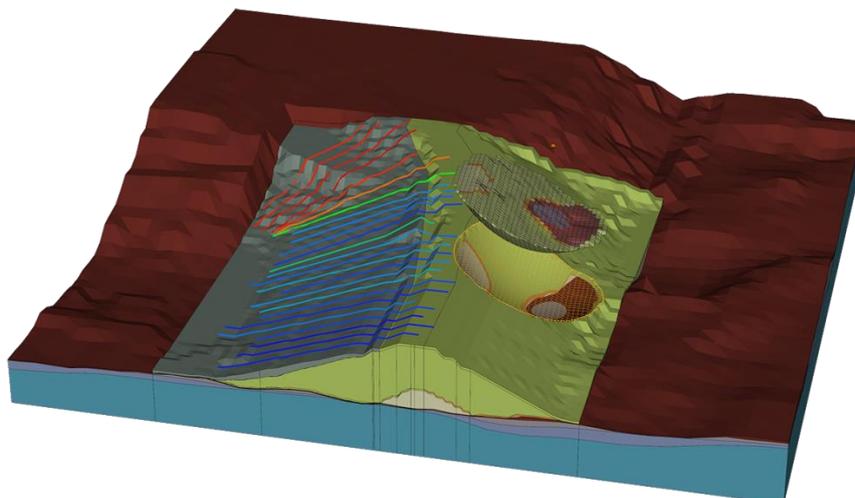
- Familiarity with standard slope stability approaches and theory is desirable.
- Each participant must be equipped with a computer. SVOFFICE 5 trial software licences will be provided for each participant, to be used during the short-course.

SVOFFICE 5 Minimum System Requirements

- O.S.: Windows 7 or newer (64-bit)
- Free Disk Space: 350MB
- Graphics Card: 256MB VRAM (available display memory)
- Video Display Resolution: 1024px x 768px
- One available USB slot

SVOFFICE 5 Recommended System Requirements

- O.S.: Windows 7 or newer (64-bit)
- Free Disk Space: 2.0GB (Full install including electronic manuals, help files, and all example models)
- Graphics Card: 2GB VRAM (available display memory) with full support for OpenGL 3.3
- Video Display Resolution: 1920px x 1080px
- One available USB slot



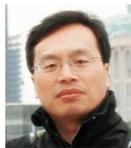
INSTRUCTOR'S BIOS



Murray Fredlund, Ph.D., P.Eng.

SoilVision Systems Ltd.

Murray is the founder of SoilVision Systems Ltd. and has spent much of his time over the past 20 years guiding the development of geotechnical software development at SoilVision Systems Ltd. He has been involved in a number of numerical modeling projects involving heap leach flow, heap leach stability, waste rock water balance and stability, tailings water balance, foundation analysis, and tailings consolidation. More recent software projects supervised have been the release of SVOFFICE™ and the new SVSLOPE® 2D/3D limit equilibrium slope stability software package. His work continues in the areas of i) unsaturated heap leach flow, ii) uranium and oil-sand large-strain tailings consolidation, and iii) applications of 2D/3D slope stability. He continues to be active in the presentation of short courses around the world as well as training on the use of geotechnical software. The software products of SoilVision Systems Ltd. apply cutting edge research to the geotechnical community and have pioneered the application of 3D analysis to main-stream. The SVOFFICE™ software is applied extensively in the mining community and is presently used in over 100 countries by consultants, universities, government agencies and multinational corporations.



HaiHua Lu, M.Sc. in Computing Science, M.Sc. in Geotechnical Engineering

SoilVision Systems Ltd.

HaiHua has been extensively involved in the development of the suite of software tools which is now SVOFFICE™5. His background includes a double Master's degree in both Geotechnical Engineering and Computing Science. His over 16 years programming experience at SoilVision Systems Ltd as a senior software engineer has involved the development of the 2D/3D SVSLOPE® and SVSOLID™ software as well as software for 3D visualization of finite element data.

GUEST LECTURER BIO



Dr. Yufeng Gao, Ph.D.

HoHai University

Dr. Yufeng Gao is a Cheung Kong Scholar Chair Professor and Dean of the College of Civil and Transportation Engineering at Hohai University. He is also the director of Key Laboratory of Ministry of Education for Geomechanics and Embankment Engineering. He obtained his Ph.D. degree from Zhejiang University in 1999 and has been with Hohai University since. His research is in soil dynamics, earthquake engineering, soil mechanics and slope engineering. He has over 95 publications in leading technical and scientific journals, including Géotechnique, ASCE Journal of Geotechnical and Geoenvironmental Engineering, Journal of Engineering Mechanics, Canadian Geotechnical Journal, Soils and Foundations, Engineering Geology, Soil Dynamics and Earthquake Engineering, Bulletin of the Seismological Society of America and Geophysical Journal International.