

Short Course:

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

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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

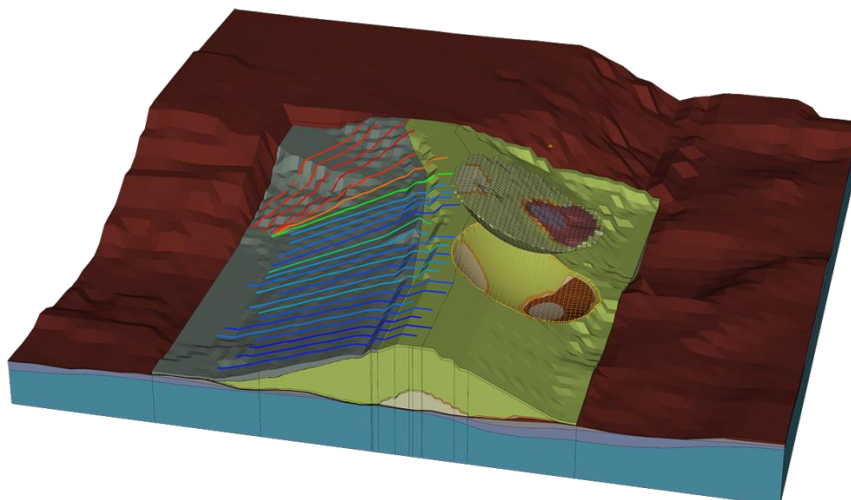
- Familiarity with standard slope stability approaches and theory is desirable.
- Each participant must be equipped with a computer. SVOFFICE 5 trial software licences will be provided for each participant, to be used during the short-course.

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.



Marina Naim Brock Trevizolli: M.Sc., Eng. Civil e Geotécnica

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Marina is a Civil Engineer with an MSc in Geotechnical Engineering from the Federal University of Paraná. She specializes in projects related to slope stability and geotechnical numerical modeling. Her work as researcher in highway slopes safety management focused on probabilistic studies and geological and geotechnical monitoring for risk measurement. She also, participated in studies related to dam safety at the Itaipu Binacional Hydroelectric Power Plant. Currently a Geotechnical Engineer at Water Services and Technologies, working on geotechnical projects, she is also a Sales Engineer and trainer for Soilvision software in Brazil.