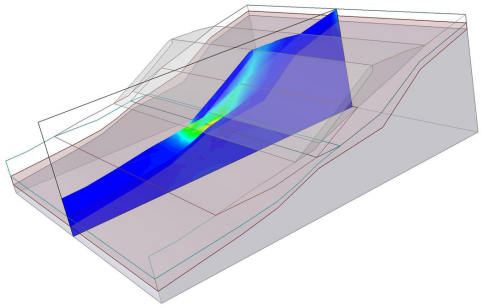
rocscience

COURSE OUTLINE
Belgrade, Republic of Serbia | 7–8 May 2020



Slope stability for 3D slopes

2D & 3D Slope Stability Assessment Using Rocscience Software

The two day comprehensive course on slope stability using Rocscience software tools is designed for all experience levels, and will focus on basics as well as advanced theoretical background of LE and FE based slope stability assessment. The course aims to address participants from diverse backgrounds such as mining, geology and civil engineering and will provide opportunities for hands-on analysis using provided examples and discussions.

Location

Holiday Inn Belgrade
Španskih Boraca 74, Beograd
11070 Republic of Serbia

Fees

Registration Fee: 200 €

Rocscience Maintenance+ subscribers receive a 10% discount on registration fees.

Register: software@geodestek.com

Note

All attendees will be provided with temporary, one month Rocscience software licenses for the programs listed above. Attendees must bring a laptop with the licenses installed.

Module I: Limit Equilibrium Approach in Slope Stability Assessment

- Basics of LE Approach in Slope Stability Assessment
- Failure Modes of Soil and Rock Slopes
- Factor Safety, Risk Based Design and Reference to EC7 Design Codes
- Overview of Geometry Search Options and Optimization Techniques
- Material Strength Models

Module II: Modeling Uncertainty in Slope Stability Assessment

- Overview of Basic Statistical Concepts and Quantification of Parameter Uncertainty
- Probability of Failure v.s. Factor of Safety
- Introduction to Modeling with Spatial Variability

Module III: 2D Anisotropy and Weak Layer Definitions

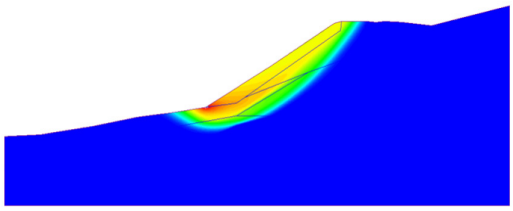
- Anisotropic Material Strength Models
- Anisotropic Surface Definition
- Definition of Weak Layers

Module IV: Shear Strength Reduction Approach

- 2D and 3D Shear Strength Reduction & Comparison with LE Methods
- SSR in Homogeneous Slopes, Multi-Layered Lithologies
- SSR in Slopes with Reinforcement, Anisotropy Definition
- FE Based Slope Stability Assessments in Jointed Rock Masses

Module V: Groundwater Modeling Options in 2D and 3D

- Phreatic Lines and Excess Pore Water Pressure Ratio Definitions
- Steady State and Transient Groundwater Flow Modeling Options
- Slope Face Drainage Modeling and Effect of Safety Factors,
- Groundwater Boundary Conditions, Infiltration Effects
- Rapid Drawdown Groundwater Modeling in LE and FE Tools
- Permeability Functions



Slope stability for 2D slopes

Tools Used

Slide2
2D Limit Equilibrium Analysis

Slide3
3D Limit Equilibrium Analysis

RS2
2D Geotechnical Finite Element Analysis

RS3
3D Geotechnical Finite Element Analysis

RSPile
3D Pile Analysis

SWedge
Surface Wedge Analysis for Slopes

UnWedge
Underground Wedge Stability Analysis

RocFall
Statistical Analysis of Rockfalls

RocPlane
Planar Wedge Analysis for Slopes

RocTopple
Toppling Stability Analysis for Slopes

Dips
Graphical & Statistical Analysis of Orientation Data

RSData
Rock, Soil, and Discontinuity Strength Analysis

Module VI: 3D LE Based Slope Stability Assessment

- Geometry Building, Point Clouds and Surface Generation Options
- Ground Surface and Subsurface Modeling Using Borehole Definitions
- Surface Repair and Regeneration Tools
- Support Design in 3D: Soil Nails, Micropiles and Geosynthetics
- Use of Surface Deformation Data for Improved Decision Making

Module VII: 3D FE Based Slope Stability Assessment

- Mesh Settings, Restraint Definitions
- 3D Anisotropy Effects
- Support Definitions in RS3

Module VIII: Geotechnical Tools for Rock Slope Stability Assessment

- New Features Tour of Rocscience Tools for Rock Slope Stability
  - Statistical Analysis of Orientation Data: Dips
  - Surface Wedge Analysis of Slopes: SWedge
  - Planar Wedge Analysis of Slopes: RocPlane
  - Toppling Stability Analysis of Slopes: RocTopple
  - Statistical Analysis of Rock Falls: RocFall
  - Underground Wedge Stability Analysis: UnWedge

Course Instructors

Dr. Zoran Berisavljević

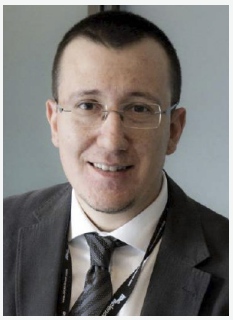
Assist. Prof., University of Belgrade, Faculty of Mining and Geology

Dr. Zoran Berisavljević is an Assoc. Prof. at the Department of Geotechnics, Faculty of Mining and Geology, University of Belgrade. In 2009, he obtained his Masters degree in Geotechnical engineering at the Faculty of Mining and Geology, University of Belgrade. In 2016, he obtained his Ph.D in Mining Engineering at the University of Belgrade in the research area of strength of highly jointed heterogeneous rock masses. He has conducted researches specializing in various aspects of geotechnical and rock engineering such as, rock tunneling, slope stability analysis and application of in situ testing in geotechnical engineering. Recently he has been involved in construction of dozens of rock cuttings along Corridor 10 and 11 highways in the Republic of Serbia. His research interests include numerical analyses of jointed rock masses, pavement engineering and ground improvement techniques. Zoran is experienced in numerical modelling, kinematic analysis, and engineering geology which unites interpretations of geological conditions to geotechnical needs.

Dr. Miloš Marjanović

Assist. Prof., University of Belgrade, Faculty of Mining and Geology

Dr. Miloš Marjanović obtained his degree in Geotechnics at the Faculty of Mining and Geology, University of Belgrade, in 2008. In 2013, he obtained his Ph.D at Department of Geoinformatics, Faculty of Science, Palacky University in Olomouc (Czech Republic) in the field of applied geoinformatics in landslide hazard assessment. His postdoc was hosted at the Chair of landslide research, Technical University of Munich, 2014-15, also in the field of landslide assessment and monitoring. He is an experienced researcher in rockfall monitoring and simulation, but also specialized in various aspects of geotechnical and rock engineering research and practice such as tunneling, slope stability analysis, in-situ and lab rock testing. He has been involved in scientific research and commercial projects along various roads and other infrastructural objects in the Republic of Serbia, Bosnia and Herzegovina, Montenegro, at various scales. His current research interests are versatile, ranging from remote sensing and applied GIS in geotechnics, via rock slope LiDAR scanning and processing point clouds for extracting jointed rock features, to numerical analyses of jointed rock masses.



A. Anıl Yunatcı, Ph.D

Geotechnical Engineer GeoDestek Zemar Ltd. Şti.

Dr. Anıl Yunatcı is working as a senior geotechnical engineer at GeoDestek Ltd. Şti. He has built experience in the field of geotechnical earthquake engineering, seismic hazard assessment, numerical modeling, geotechnical monitoring and soil investigation studies over 20 years. Dr. Yunatcı received his Bachelors degree in Civil Engineering in 1999 from Gazi University in Turkey. He then obtained his Masters and Ph.D.degree in geotechnical engineering from Middle East Technical University, Turkey in 2010. Dr. Yunatcı is in charge of organizing and developing numerous customized Rocscience courses and workshop events nationwide and internationally. Within GeoDestek, he has been participating as a co-lecturer in Rocscience oriented numerical modeling courses since 2013.

Yalın Umur Doğan, MSc.

Engineering Geologist, GeoDestek Zemar Ltd. Şti.

Yalın Umur Doğan is working as an Engineering Geologist at GeoDestek Ltd. Sti. He received his Bachelor's degree in Geological Engineering in 2014 from Hacettepe University. He then obtained his Master's degree in geotechnical engineering from Gazi University in 2019. He is also currently serving as a member of the Geotechnics and Engineering Geology Commission in Chamber of Geological Engineers of Turkey.
His professional and research experiences include geotechnical site characterization, in-situ test, slope stability, 2D and 3D effects in slope stability problems, shear strength reduction approach and effects of various methods in bi-planar failure mechanisms. Within Geodestek, he has been participating as a co-lecturer in Rocscience oriented numerical modeling courses since 2018.

2D & 3D Slope Stability Assessment Using Rocscience Software

Name: _____ Surname: _____

Title: _____

Contact Phone: _____ E-mail: _____

Company / Organization Name: _____

Address: _____

Invoice Information: _____

What Rocscience software do you currently use? _____

Which other geotechnical software programs have you used? _____

Dietary Restrictions: _____

Fee Structure

Registration Fee: 200 €

Rocscience Maintenance+ subscribers receive a 10% discount on registration fees.

Payment Details

Recipient Account Holder Name:

GeoDestek Zemar Zemin Arastirma Proje Mus. Ins. Tur. Ith. Ihr. Tic. ve San. Ltd. Sti.

Recipient Account Office Address:

Kizilcasar Mah. Incek Koy Sitesi 23 Nisan Cad. No:28, Incek, Golbasi, Ankara, Turkey

Bank Account Details: *Turkiye Is Bankasi* Bank SWIFT Code: *ISBKTRIS* Branch ID No: *4229*

Branch Name: *O.D.T.U./Ankara*

IBAN No: *TR67 0006 4000 0024 2293 5993 47 (Euro)*

Bank Branch Address: *Universiteler Mahallesi ODTU Kumeevleri No:62 Cankaya, ANKARA, TURKEY*

Transfer process fees during bank-wiring is within responsibility of the participant.

Terms and Conditions

- For registration, please fill the form and send to software@geodestek.com for receiving the payment instructions and guide for registration confirmation.
- Registration will be accepted in the order in which they are received. Total seat capacity is limited.
- The fee covers attendance to all technical sessions of the course, temporary licenses for full working versions of the software, lunches, coffee breaks, course material delivered via USB flash drive and attendance certificate. Transportation, accomodation, and dinners are excluded.
- Participants are highly encouraged to bring their own computers to the sessions and follow the hands-on tutorials and examples within the scope of the course. Sessions will start at 9 a.m. and end at 5 p.m.
- Course will be delivered in English.
- No refunds will be applied for cancellations made after April 1, 2020.