

*Hands-on-Training Programme on*  
**Slope Stability Analysis of Mine Pits and Dumps using Rocscience Software Tools, with an Overview of Monitoring Methods**

Date : 2<sup>nd</sup> - 6<sup>th</sup> June 2026 (Tuesday to Saturday)

Venue: Department of Mining Engineering, IIT Kharagpur



**Key Faculty**



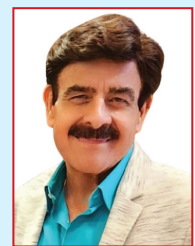
Prof. Debasis Deb



Prof. A. K. Verma



Dr Rakesh Kumar



Dr Manoj Verman

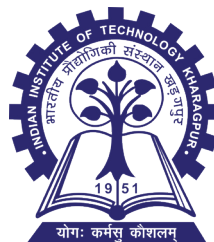
**Organized by**



New Delhi  
Central Board of Irrigation & Power



ISRM (India)



योग: कर्मसु कौशलम्

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## INTRODUCTION

Open-pit mines demand precise slope stability analysis to ensure safety, operational efficiency, and economic feasibility. With increasing complexity in geotechnical challenges, advanced software tools are indispensable for effective slope design and analysis.

This five-day Hands-on Training Programme is designed to equip mining engineers, geotechnical professionals, and researchers with practical skills to use Rocscience software for slope stability analysis in open-pit mining. Participants will engage in real-world problem-solving and hands-on application of industry-leading software tools.

Led by a seasoned expert in geotechnical engineering, this programme provides a unique opportunity to explore best practices, master advanced techniques, and deepen your understanding of slope stability analysis.

## KEY HIGHLIGHTS

- Concept of slope stability analysis for mine pits and dumps
- Laboratory demonstration for determining various properties of rocks and dumps for slope stability analysis
- Hands-on training with Rocscience software: Dips, RocSlope2, RocSlope3, RocFall2, RocFall3, Slide2, Slide3, RS2, RS3, RSData.
- Real-world case studies to bridge theory and practice.
- Expert-led tutorials with interactive problem-solving exercises.
- Comprehensive coverage of critical topics, including kinematic analysis, 2D and 3D stability modelling, and finite element analysis.

## WHO SHOULD ATTEND?

This programme is ideal for:

- Mining and geotechnical engineers involved in open-pit design and analysis.
- Researchers and academicians in mining and geotechnical engineering.
- Project managers and consultants working on open-pit mining projects.
- Professionals interested in advancing their skills in slope stability and geotechnical software.

## SOFTWARE OVERVIEW

This training programme will provide hands-on experience with the following Rocscience software tools, tailored to slope stability analysis for open-pit mining:

### 1. Dips

A stereographic projection tool used for analysing orientation data to evaluate kinematic stability and potential structurally-controlled failure modes in rock slopes.

### 2. RocSlope2

A specialized tool for 2D slope stability analysis using the limit equilibrium method, ideal for assessing planar, wedge, and toppling failures.

### 3. RocSlope3

A powerful 3D limit equilibrium software designed for assessing the factors of safety of thousands of blocks in highly jointed rock masses, where failures are structurally controlled.

### 4. RocFall2

A 2D rockfall trajectory simulation tool that evaluates the impact of falling rocks and assists in designing mitigation measures.

### 5. RocFall3

A 3D extension of RocFall2 for simulating rockfall paths and impacts in large-scale open-pit mining scenarios.

### 6. Slide2

A comprehensive 2D limit equilibrium software for modelling and analysing slope stability, groundwater and reinforcement systems.

### 7. Slide3

A 3D slope stability analysis tool that enables detailed modelling of complex geometries, material properties, and failure mechanisms.

### 8. RS2

A 2D finite element software for stress-deformation analysis, particularly suited for evaluating stability in weak rock formations and designing support systems.

### 9. RS3

A complete 3D finite element package for geotechnical analysis, offering advanced modelling capabilities for complex slopes and geological conditions.

### 10. RSData

A data analysis tool for interpreting rock and soil strength parameters, generating strength envelopes for input into slope stability models.

## TENTATIVE SCHEDULE

### Day 1: Foundations of Slope Stability Analysis

- Morning Session:
  - o Fundamentals of slope design in open-pit mines and dumps.
  - o Structural Geology and Data Interpretation.
  - o Significance of rock and dump properties in slope stability analysis
- Afternoon Session:
  - o Determination of rock and dump properties in the laboratory
    - Grain and bulk density
    - Proctor test for optimum moisture content
    - UCS, Modulus, Poisson's ratio, Tensile strength

### Day 2: Advanced 2D and 3D Slope Stability Analysis for Jointed Rock Mass

- Morning Session:
  - o Stereonets and their use in kinematic analysis of rock slopes
  - o Kinematic Analysis using Dips.
  - o Overview of various software tools for slope stability analysis:
  - o 2D slope stability analysis for planar, wedge and toppling failures using RocSlope2
- Afternoon Session:
  - o Direct shear tests of joint properties
  - o Direct shear tests of dump materials
  - o Triaxial testing of rocks for determining cohesion and friction angle of rocks

### Day 3: Advanced 2D and 3D Limit Equilibrium Slope Stability Analysis for in Soil and Rock

- Morning Session:
  - o 2D Limit Equilibrium slope stability analysis using Slide2.
  - o 3D Limit Equilibrium slope stability analysis using Slide3.
  - o Case studies from mine pit and dump slopes
- Afternoon Session:
  - o Hands-on with RocSlope3: Building 3D models, conducting block stability analysis, and designing slope stabilisation measures.

## Day 4: 2D and 3D Finite Element Analysis for Slopes in Soil and Rock

- Morning Session:
  - Analysing rock and soil strength data and determining strength envelope parameters with RS Data.
  - 2D FEM slope stability analysis using RS2 and case studies.
- Afternoon Session:
  - Concept of Q-slope and Slope Mass Rating (SMR) in slope stability analysis
  - 3D FEM slope stability analysis using RS3 and case studies.

## Day 5: Advanced Rockfall Analysis and Integrated Data Management

- Morning Session:
  - Assessing Rockfall hazards in 2D and designing barriers using RocFall2.
  - Advanced 3D rockfall simulation with RocFall3.
- Afternoon Session:
  - Instrumentation and Monitoring of pit and dump slopes
  - Development of Trigger Action Response Plan (TARP) based on numerical analysis and monitoring results

## DATES & VENUE

The date for the event is Date : 2nd - 6th June 2026 (Tuesday to Saturday) at Department of Mining Engineering, IIT Kharagpur

## OFFICIAL LANGUAGE

The official language for the event is English.

## REGISTRATION FEE\*

- The registration fee for participation is Rs. 25,000/- per participant.
- There would be discounted fee of Rs. 22,500/- per participant, applicable for Members of CBIP and ISRM
- 50% discount in the fee will be applicable for Students (upto 35 years of age)

\*GST 18% will be charged extra on Registration fee.

The registration fee includes registration kit, working lunch, tea/ coffee during the event only. The participants will have to make their own arrangement for boarding and lodging, transport, etc.

- The registration fee includes temporary licenses (full version) of these software for 15 days
- The participants must bring their laptops.

Spot registration facility will also be available provided prior Information is received.

## PAYMENTS

The payment related to the event is to be remitted either through cheque in favour of ISRM or through bank transfer to the following account:

Name of Bank : Canara Bank Address : Delhi Diplomatic Enclave, 7/48, Malcha Marg, Chanakyapuri, New Delhi 21  
Account No. : 0157101031512, MICR Code No. 110015007 Account Holder's Name THE COMMITTEE OF THE ISRM  
IFSC Code CNRB0000157, Swift Code CNRBINBDBFS

Bank charges if any, must be borne by the participants and should not be deducted from the amount remitted.

**Once the payment is done, please share the screen shot along with registration form.**

## OPPORTUNITIES FOR SPONSORSHIP

Scope exists for organizations to be the Sponsor on lump sum payment with following attendant benefits:

Platinum Sponsor : Rs. 3,00,000/-	Gold Sponsor : Rs. 2,00,000/-	Silver sponsor : Rs. 1,00,000/-
<ul style="list-style-type: none"><li>• 5 delegate passes for participation</li><li>• Company logo on main banner</li><li>• Announcement - Thanking sponsor</li><li>• Circulation of Company Literature</li><li>• Speaking Opportunity</li><li>• Complimentary Advertisement in the Key Journal Published immediately after the event covering report of the event</li><li>• Special Invite to the head of organization.</li></ul>	<ul style="list-style-type: none"><li>• 03 delegate passes for participation</li><li>• Company logo on main banner</li><li>• Announcement -Thanking sponsor</li><li>• Circulation of Company Literature</li><li>• Complimentary Advertisement in the Key Journal Published immediately after the event covering report of the event</li></ul>	<ul style="list-style-type: none"><li>• 01 delegate passes for participation</li><li>• Company logo on main Banner</li><li>• Announcement - Thanking sponsor</li><li>• Circulation of Company Literature</li></ul>

## OPPORTUNITIES FOR TABLE TOP DISPLAY

Limited Slots are available @ Rs. 50,000/- Plus GST, for display of products, services & Innovations.

## TRAINING PROGRAMME INSTRUCTORS

**Prof. Debasis Deb**, Professor, Department of Mining Engineering, IIT Kharagpur

**Prof. A. K. Verma**, Professor, Department of Mining Engineering, IIT Kharagpur

**Dr Rakesh Kumar**, Assistant Professor, Department of Mining Engineering, IIT Kharagpur

**Dr Manoj Verma**, Rock Engineering Expert



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**REGISTRATION FORM**

1. Name \_\_\_\_\_  
(First Name) (Middle Name) (Surname)
2. Position \_\_\_\_\_
3. Organization \_\_\_\_\_
- Address \_\_\_\_\_
5. City \_\_\_\_\_ PIN \_\_\_\_\_
6. Mobile No. \_\_\_\_\_ (whatsApp No.) \_\_\_\_\_
7. E-mail ID \_\_\_\_\_
8. Bank Draft No./ Online Bank Transaction ID \_\_\_\_\_ dated  
\_\_\_\_\_ for Rs. \_\_\_\_\_ is enclosed.
9. I intend to participate in the deliberations of the event.

Place: \_\_\_\_\_

Date : \_\_\_\_\_

\_\_\_\_\_  
(Signature)

**SECRETARIAT**

*All correspondence relating to the event should be addressed to:*

**Shri A.K. Dinkar**, Secretary, CBIP & Member Secretary, ISRM  
C/o CBIP, Plot No. 4, Institutional Area, Malcha Marg, Chanakyapuri, New Delhi-110 021  
Phone: 91-11-26115984 / 26116567 Website: [www.cbip.org](http://www.cbip.org)

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