



**IIT
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**INDIAN INSTITUTE
OF TECHNOLOGY**
INDIAN SCHOOL OF MINES
DHANBAD

Department of Mining Engineering



THE MINING EDGE

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From HoD's Desk



Dear Readers,

Greetings from the Department of Mining Engineering!

The Department of Mining Engineering had a vibrant and eventful February 2025, marked by several impactful activities. We organized executive development programs for DGMS and BRO executives, as well as educational coal mine excursions for our Mining Engineering students to the coal mines of Eastern Coalfields Limited (ECL).

Additionally, the department launched the Training of Trainers (ToT) Program program under the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 4.0 and the NSDC scheme, which aims to bring together experts, educators, and trainers to enhance their skills and teaching quality in the field of mine surveying.

As always, the department thrives on promoting cutting-edge mining technologies and continually updates its curriculum to meet the evolving needs of the industry. One notable initiative in this endeavour is the inclusion of the 'Seabed and Extra-Terrestrial Mining' course in our syllabus in the pursuit of exploration and exploitation of critical minerals from asteroids, the Moon, Mars, and beneath the ocean floor. This initiative aligns with the vision of the Government of India and draws inspiration from the successes of the Chandrayaan missions.

The successful landing of Vikram lander and Pragyan rover near the Moon's south pole in India's Chandrayaan-3 mission marked a significant milestone in exploring resources and the potential for mining on the lunar surface and other celestial bodies. We are optimistic that future Chandrayaan missions will successfully bring soil samples back to Earth, enabling a deeper understanding of the mineral resources available on the Moon. Such advancements will provide a significant boost to the global mining community and, in particular, to the Department of Mining Engineering at IIT(ISM) Dhanbad.

There is still much to be done to enhance the institute's capabilities in this emerging field. Establishing state-of-the-art laboratory facilities dedicated to extra-terrestrial and seabed mining will be essential in equipping the next-gen mining engineers with the expertise needed to thrive in these exciting areas.

Best Regards,
D.P. Mishra



Two Weeks Professional Development Programme on "Controlled Blasting Management for Road Construction" for the executives of BRO

Department of Mining Engineering organised the two weeks professional development programme on "Controlled Blasting Management for Road Construction" for the executives of Border Road Organisation (BRO) scheduled from 24 February 2025 to 8 March 2025. The inaugural ceremony held on 24 February 2025, marked the commencement of the programme. The course is designed to empower the officers with advanced techniques of blasting operations, safety protocols, and sustainable practices for critical infrastructure projects of BRO.

The event was graced by the presence of Prof. A.K. Mishra, Director, CSIR-CIMFR, Dhanbad, as the Chief Guest. His insightful address underscored the importance of precision in blasting operations and adherence to safety standards in challenging terrains. The Chief Guest emphasized the long-term collaboration between IIT(ISM) Dhanbad and BRO, and lauded the role of IIT(ISM) Dhanbad in advancing the technical expertise for national development.





Inaugural ceremony of the Professional Development Programme

The ceremony also witnessed the esteemed presence of Prof. M.K. Singh, Director (CD), and Prof. D.P. Mishra, HOD (Mining Engineering), who highlighted the commitment of Department of Mining Engineering, IIT(ISM) Dhanbad towards fostering innovation in mining and infrastructure development.

The course coordinators, Prof. B.S. Choudhary and Prof. D.G. Krishna, outlined the course curriculum, which blends theoretical knowledge with hands-on practice, case studies, and simulations. The program aims to equip BRO officers with cutting-edge strategies for efficient blast design, risk mitigation, environmental compliance, and post-blast analysis.

The inaugural session concluded with a vote of thanks, recognizing the collective efforts of faculty, organizers, and participants in making this initiative a reality.

Let's Build a Safer Tomorrow!



Five Days Training Programme on “Investigation into Accidents/Incidents in Mines: Root Cause Analysis Techniques & Auditing of Safety & Health Management Systems”

Department of Mining Engineering conducted a five days training program on “Investigation into Accidents/Incidents in Mines: Root Cause Analysis Techniques and Auditing of Safety and Health Management Systems” in Mines for the officers of the Directorate General of Mines Safety (DGMS) during 18-22 February 2025. The program was customized to enhance the expertise of the officers in accident prevention, systematic incident analysis, and safety compliance in mining operations.

Shri Ujjwal Tah, Chief Inspector of Mines and Director General of Mines Safety, DGMS Dhanbad graced the occasion as the Chief Guest. In his address, he emphasized the urgency of adopting advanced root cause analysis techniques and robust safety auditing frameworks to mitigate the risks and uphold occupational health standards in the Indian mining industry.

The inaugural function of the event witnessed the presence of esteemed faculty and dignitaries, including Prof. Dheeraj Kumar, Deputy Director, IIT(ISM) Dhanbad, and Prof. D.P. Mishra, HOD (Mining Engineering), who reiterated the institute’s dedication in advancing mining safety through cutting-edge research and industry-academia collaborations. The course coordinators, Prof. R.M. Bhattacharjee and Prof. P.S. Paul, elaborated on the course curriculum, which covers theoretical insights, case studies, and interactive workshops to empower DGMS officers with skills in investigation, data-driven decision-making, and compliance auditing.





Inaugural ceremony of the Training Programme

The programme trained 31 participants of DGMS with techniques to dissect accident scenarios, identify systemic flaws, and implement corrective measures. The major topics included in the course were advanced RCA techniques, safety management system audits, risk assessment protocols, and leveraging technology for proactive hazard prevention.

The Chief Guest applauded the initiatives of Department of Mining Engineering, IIT(ISM) Dhanbad in addressing the contemporary challenges in mine safety, stressing the need for continuous learning and adherence to the global best practices. The session concluded with a vote of thanks, acknowledging the collaborative efforts of the faculty, DGMS, and participants in driving this initiative.

This transformative training programme will enable the participants to contribute in fostering a safer, healthier, and more sustainable mining ecosystem across the nation.

Towards Zero Harm in Mining



Inauguration of Training of Trainers (ToT) Programme

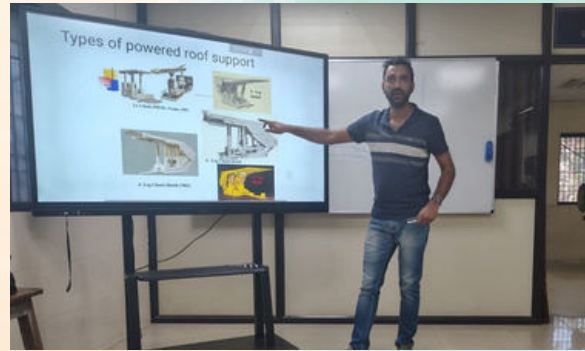


The Training of Trainers (ToT) programme, under the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) 4.0 & NSDC scheme, was organised by the Department of Mining Engineering, IIT(ISM) Dhanbad from 28 February 2025 to 10 March 2025. The programme was inaugurated on 28 February 2025. The training programme aims to bring together the experts, educators, and trainers to enhance their skills and teaching quality and ensure the development of highly competent professionals in the field of mine surveying. The initiative is to equip the trainers with advanced knowledge and technical skills in mining surveying and engineering, innovative teaching methodologies to enhance training effectiveness, and industry-aligned skilling programs to meet the global standards. The inaugural ceremony was graced by esteemed dignitaries, including Prof. Dheeraj Kumar, Deputy Director & Programme Advisor; Prof. A.K. Das, Dean (IIE); Dr. Koushik Mondal Coordinator, ToT/CC; and Dr. Sunil Kumar, Coordinator. The training program will utilise the modern surveying instruments and digital learning tools to ensure hands-on experience and practical exposure of the trainers. A step towards excellence with the legacy of IIT (ISM) Dhanbad and the support of PMKVY 4.0 & NSDC, this initiative aims to bridge the skill gap in the mining industry and empower trainers to create a more knowledgeable and competent workforce. The training program promises to be a game-changer in the field of mine surveying and engineering, reinforcing India's commitment to skill development and innovation in technical education.



Longwall Training Gallery Visit

Visit of third-year Mechanical Engineering students



The Department of Mining Engineering imparted a hands-on training on Longwall Mining for the third-year Mechanical Engineering students of the institute at the Longwall Training Gallery.

As a part of their practical, the third-year Mechanical Engineering students, accompanied by Prof. L.A. Kumaraswamidhas, participated in the Longwall Training. Prof. D.G. Krishna, Assistant Professor, Department of Mining Engineering guided and explained the fundamentals of the longwall mining technology to the students.

The practical training was assisted by Mr. Sudhanshu Pandey and Mr. Manish Kumar, JTs of the Department of Mining Engineering. The training provided an unique opportunity for the students to engage directly with longwall mining machinery, including shearer, hydraulic roof supports, and armored face conveyor (AFC). This hands-on exposure enabled the learners to observe the interplay of engineering and automation in a controlled environment. Different aspects, such as aligning roof supports, managing conveyor systems, and troubleshooting operational delays mirrored real-world scenarios, reinforcing the focus on problem-solving and technical proficiency.

The session was concluded with a debriefing, highlighting how the training fulfills the objective of academic curriculum in bridging theory and practical.



Visit of Youth Delegation from Jammu & Kashmir



The Department of Mining Engineering organized a visit of the team comprising 125 young participants from six different districts of Jammu & Kashmir to the Longwall Training Gallery as a part of the “Watan Ko Jano-Youth Exchange Program”, an initiative of the Government of India under the spirit of “Ek Bharat Shrestha Bharat”.



Research Publications



Dasgupta T., Mishra D.P., Pandey A. (2025) Investigation of thermal stability, heat transfer dynamics, low-temperature oxidation kinetics and gas evolution profiles of coal: An innovative approach. *Fuel*, Vol. 381, Part A, 133354. <https://doi.org/10.1016/j.fuel.2024.133354>

Bulushi I.R., Deressa G.W., Choudhary B.S. (2025) Prediction and control of ground vibrations due to blasting activities in aggregate mines. *Journal of Sustainable Mining*, Vol. 24(2). <https://doi.org/10.46873/2300-3960.1452>

Deressa G.W., Choudhary B.S. & Jilo N.Z. (2025) Optimizing blast design and bench geometry for stability and productivity in open pit limestone mines using experimental and numerical approaches. *Sci Rep* 15, 5796. <https://doi.org/10.1038/s41598-025-90242-6>

Rohit T.S., Villuri V.G.K. (2025) Impact of Slope Cutoff Factor on Soil Erosion Estimates: A Hilltop Mine-Based Comparative Geospatial Study. <https://doi.org/10.1002/ldr.5478>

Soni R., Alam M.S., Vishwakarma GK. (2025) Prediction of InSAR deformation time-series using improved LSTM deep learning model. <https://doi.org/10.1038/s41598-024-83084>





Mine Excursion



Department of Mining Engineering successfully organised the educational coal mine excursion for the 2nd Year B.Tech. Mining Engineering students. The students visited the Jhanjra Underground Coal Mining Project and Sonapur Bazari Opencast Mining Project of Eastern Coalfields Limited (ECL) on 09 February 2025. The students gained invaluable insights into the real coal mining operations during these field visits.

Accompanied by the faculty members of the Department and guided by industry professionals, the students witnessed the mining excavation, ventilation system, and sustainable mining practices. The students observed the mass production underground and opencast mining technologies, working of advanced mining machineries, and safety protocols in practice. Interaction of the students with the faculty members and field experts enriched their understanding about operational contrasts between the underground and opencast mining projects.

Aligned with the Department mission to prioritize field-based learning, the excursions provided the students a platform to connect the theoretical concepts with the on-ground mining practices. Such exposure is pivotal in shaping the future mining engineers to innovate and lead the evolving mining sector.

The Department extends heartfelt gratitude to the management of Eastern Coalfields Limited (ECL) for their support in facilitating the mine excursions. Special thanks to the faculty members and ECL team for ensuring a safe, informative, and impactful excursion and learning experience to the students.



Departmental Picnic



The Department of Mining Engineering organized the Departmental Picnic on 5 January 2025 at the picturesque Khandoli Dam, Giridih. Faculty members, Research scholars, staff, along with their family members gathered for a day of camaraderie, adventure, and relaxation amidst the serene beauty of Jharkhand's natural landscape.



Departmental Picnic



Photographs taken during picnic at Khandoli



Departmental Picnic



Sports activities during picnic at Khandoli



Departmental Picnic

A Day of Fun and Bonding

The event kicked off with a scenic drive to Khandoli, where the participants were greeted by the tranquil waters of the dam and the lush surrounding hills. The day was packed with activities designed to foster teamwork and unwind from academic rigors:

- **Team-Building Games:** A spirited game of cricket, dumb charades, overhead glass balancing, blowing up the balloon, etc.
- **Nature Walks & Photography:** Families explored Khandoli's trails, capturing stunning views of the reservoir and granite hills.
- **Boating Adventures:** Groups enjoyed leisurely boat rides on the dam's calm waters, soaking in the winter sun.
- **Picnic food:** Picnic was started with the breakfast followed by lunch and evening snacks at the closing of the picnic at Khandoli.



Faculty Profile of the Department



Prof. V M S R Murthy

Professor (HAG)
On Deputation As Director
IIST Shibpur

Research Interest:
Rock Excavation Engineering



Prof. Arvind Kumar Mishra

Professor (HAG)
On Deputation As Director
CIMFR

Research Interest:
Explosive Engineering, Rock
Blasting Technology, Rock
Excavation Engineering,
Opencast Mining



Prof. Dheeraj Kumar

Professor (HAG)

Research Interest:
Digital Mining Technologies,
Mine Surveying & Geospatial
Technologies



Prof. R M Bhattacharjee
Professor

Research Interest:
Underground Coal Mining
Technology, Risk Assessment
And Safety Management,
Emergency Response &
Disaster Management,
Accident Investigation, Mine
Fire And Explosion



Prof. Devi Prasad Mishra
Professor

Research Interest:
Mine Ventilation And
Environmental Engineering, Mine
Fire And Explosion, Application Of
CFD In Mine Ventilation And
Environmental Engineering,
Methane Drainage/CBM/UCG,
Stowing/backfilling With Fly
Ash/pond Ash, Characterization Of
Fly Ash/pond Ash



**Prof. Bhanwar Singh
Choudhary**
Professor

Research Interest:
Drilling & Blasting Technology,
Underground Metal Mines,
Computer Aided Mine Planning,
Tunnel Engineering



Prof. Partha Sarathi Paul
Professor

Research Interest:
Core Mining Discipline: Mine
Safety Engineering; Occupational
Health, Safety And Ergonomics;
Applied Multivariate Modeling
And ML Techniques; Rock
Mechanics; Mine Ventilation.
Interdisciplinary: Automation For
Workplace Safety; Socio-
economic Impact Of Mining



**Prof. Subhas Chandra
Bhowmik**
Adjunct Professor

Research Interest:
Underground Metal Mine,
Green Field Project from
Planning to Operation, Shaft
Sinking



Prof. Anindya Sinha
Professor of Practice

Research Interest:
Mine Planning & Design,
Mine Environment
Planning & Management,
Mine Mechanization &
Digitization



Prof. Rabindra Kumar Sinha
Associate Professor

Research Interest:
Design of Structures in Rock,
In situ Rock Mechanics
Investigations, Numerical
Modelling



**Prof. Vasanta Govind
Kumar Villuri**
Associate Professor

Research Interest:
Photogrammetry,
Cartography, Remote Sensing,
GIS And GPS



Prof. Radhakanta Koner
Associate Professor

Research Interest:
Mine Automation, Data Analytics,
Georesources Utilization Using
Remote Sensing Technology,
Slope Stability Analysis,
Landslide Analysis, Wireless
Sensing Technology, Real-time
Monitoring System In Mining



Faculty Profile of the Department



Prof. Patitapaban Sahu
Associate Professor

Research Interest:

Mine Ventilation, Sub-surface Environmental Engineering, Mine Radiation, CBM And Data Analytics In Mining



Prof. Gnananandh Budi
Assistant Professor

Research Interest:

Rock Mechanics And Ground Control



Prof. Kashinath Pal
Assistant Professor

Research Interest:

Rock Mechanics, Groundwater, Slope Stability



Prof. Mohammad Soyeab Alam
Assistant Professor

Research Interest:

Geospatial Technology In Mining, Underground Metal Mining, Mine Subsidence Studies, Mine Slope Stability Analysis, Mine Surveying



Prof. Siddhartha Agarwal
Assistant Professor

Research Interest:

Digitalization Of Mining Operations, Industry 4.0 Applications In Mining, Machine Learning And Artificial Intelligence Applications In Energy Consumption In Mines, Earth Sciences: Geostatistics, Open Pit Mine Planning & Scheduling, Real Time Monitoring Of Air Pollution In Open Cast Mines, Geo-technical And Environmental Closure And Repurposing Planning



Prof. Swapnil Mishra
Assistant Professor

Research Interest:

Blast Resistant Design of Underground Structures, In-situ Stresses Surrounding Underground Structures, Impact Testing on Weak and Weathered Rock Conditions, Ground Subsidence, Rock Dynamics and Material Testing, Physical Modelling



Prof. Ashok Kumar
Assistant Professor

Research Interest:

Underground Mining Methods, Strata/Rock Mechanics, Numerical Modeling, Underground Instrumentation And Monitoring Of Strata, Support Design, Rockmass Characterisation, Excavation Methods For Tunnels & Caverns, Drilling & Blasting, Operations Research, Mine Environment, Surface Mining



Prof. Dondapati Gopi Krishna
Assistant Professor

Research Interest:

Rock Mechanics, Numerical Modeling in Geotechnical Engineering, Coal Mining, Mine Instrumentation and Monitoring



Prof. Bhaskara Behera
Assistant Professor

Research Interest:

Rock Mechanics And Ground Control, Mining Methods, Numerical Methods In Geomechanics, Mine Planning And Design



Prof. Ajeet Yadav
Assistant Professor

Research Interest:

Rock Mechanics and Ground Control, Mining Methods, Mine Ventilation, Numerical Modelling



Prof. Ankush Galav
Assistant Professor

Research Interest:

Rock Mechanics and Ground Control, Mining Methods, Rock Excavation Engineering, Numerical Modelling, Mine Planning and Design, Mine Instrumentation and Monitoring



2025 CALENDAR

JANUARY

M	T	W	T	F	S	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
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27	28	29	30	31		

FEBRUARY

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MARCH

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APRIL

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28	29	30				

MAY

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JUNE

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JULY

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AUGUST

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SEPTEMBER

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29	30					

OCTOBER

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NOVEMBER

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DECEMBER

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22	23	24	25	26	27	28
29	30					

2025 Calendar of Important Mining Days

4th April : International Day for Mine Awareness and Assistance in Mine Action

22nd April : World Earth Day

1st May : International Labour Day

4th May : Coal Miners Day

23rd June : International Women in Engineering Day

30th October : Mine Rescue Day

1st November : Coal India Foundation Day

1st November : Indian Mining Day

5th December : World Soil Day

11th December : International Mountain Day

14th December : National Energy Conservation Day

