



Indian Institute of Engineering Science and Technology, Shibpur

An Institute of National Importance

भारतीय अभियांत्रिकी विज्ञान एवं प्रौद्योगिकी संस्थान, शिवपुर



# खनन अभियांत्रिकी विभाग DEPARTMENT OF MINING ENGINEERING

*Serving the nation since 1906*



A Biannual Newsletter  
June - Dec, 2024



## Department of Mining Engineering

### Message from HoD's Desk



**Dr. Gopal Chandra Roy**  
Assistant Professor

It is with great enthusiasm that we present this edition of our newsletter, showcasing the remarkable achievements and ongoing efforts of the Department of Mining Engineering at IEST, Shibpur. Since its inception, the Department has been at the forefront of advancing education, research, and innovation in the dynamic field of mining engineering. With a keen focus on sustainable practices, safety, and environmental stewardship, we are dedicated to tackling the industry's challenges through pioneering research, cross-disciplinary collaborations, and the cultivation of highly skilled professionals. Our unwavering commitment is to shape the future of mining engineering and play a pivotal role in driving the global growth and sustainability of the mining sector.

The vision of the Department of Mining Engineering is both ambitious and focused: to lead pioneering research and educational initiatives in areas crucial to the mining industry, national development, and safety. We aim to develop innovative and sustainable solutions to complex mining challenges, ensuring resource efficiency, environmental stewardship, and the highest standards of safety. Through collaborative efforts with various departments within the institute, industry partners, and relevant academic, technological, and management institutions, the Department aspires to establish itself as an internationally recognized Centre of Excellence in mining engineering.

This issue highlights the Department's academic and research activities, including the programs offered, key areas of focus, and the outcomes achieved through our collective efforts. Notable achievements include publications in prestigious journals, ongoing research and development projects, and state-of-the-art laboratories that support our research initiatives, particularly in the field of mining safety and risk management.

Our core belief is that impactful advancements in mining technologies and safety protocols require the active collaboration of multiple stakeholders. At the Department of Mining Engineering, we strive to develop strategies and models that bring together academia, industry, and society to drive meaningful innovations that can transform the mining sector while safeguarding the well-being of workers and communities.

I would like to express my sincere gratitude to our faculty, researchers, students, and collaborators who have played an integral role in the Department's growth and success. I hope this newsletter serves to inspire and inform our readers about our progress and future directions.

Warm regards,

### Courses offered

- B.E
- M.Tech
- Ph. D.

### Thrust Areas

- Environmental and Resource Management
- Safety and Occupational Health Engineering
- Ergonomics and Human Factors
- Technology and Data Applications
- Project Management and Optimization
- Rock Engineering

## SAFETY & ERGONOMICS LAB

Safety and Ergonomics Laboratory aims to investigate and standardize safety measures and ergonomic practices specific to the mining industry. The lab focuses on evaluating and improving the working conditions, equipment design, and safety protocols to minimize risks and enhance worker well-being. Through the study of human factors, environmental conditions, and mining technologies, the lab strives to ensure safe, efficient, and comfortable work environments, while reducing injuries and optimizing overall productivity in mining operations.

### Equipment present in the lab



EMG



Triaxial Vibration Analyzer



Spirometry



Trademill Stress Testing System



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### Recognitions

#### 1. Patent Application:

##### Dr. Sudipta Mukherjee

- A recent Advancement In Dry Beneficiation System And Method For Removing Foreign Materials From Raw Lignite Materials. (Patent Application No. 202421053907), Date of Filing: 17/07/2024

#### 2. Book published:

##### Dr. N C Dey

- 6<sup>th</sup> Edition of MCQ Book for Mining Engineers in June, 2024 from Lovely Prakashan and Geeta Book Publishers, Dhanbad.
- Edited Papers in AIS seminar Volume on “Recent advances in Smart Mining technologies and Resources” in July 2024, ISBN : 978-81-966131-1-2

#### 3. Publications:

- “Stochastic modelling of Continuous Miner based underground coal mine production planning through curve-fitting and regression approach” by Sumit Banerjee and Netai Chandra Dey, accepted in the scientific journal Acta Montanistica Slovaca Letna 9, 04200 Kosice, Slovak Republic for publication in Nov 2024.
- Hoque M I and Dey N C (2024); “in a national Seminar on “Recent advances in Smart Mining Technologies and Resources” held on July 19 – 20, 2024
- Hore A, Dey N C (2024) “Covid 19 outbreak: back to work place safely after lock down; “in a national Seminar on “Recent advances in Smart Mining Technologies and Resources” held on July 19 – 20, 2024.
- On Underground Mine Communication Systems  
Authors: Saikat Chandra Bakshi, Gopal Chandra Roy and E. Eravelli Saicharan and E. Parvathi  
January 04, 2025
- . On IoT-based Underground Mine Environment Monitoring Systems  
Authors: Saikat Chandra Bakshi, Gopal Chandra Roy, Ankita Pramanik and E. Eravelli Saicharan  
, January 07, 2025.  
Sengupta, Utsav, Muthaimanoj Periyasamy, Jit Satra, Sudipta Mukhopadhyay, and Arik Kar.; Controlled and automatic fabrication of ultra small SnO<sub>2</sub>-CdS nano-heterojunction via continuous flow method designed for photochemical treatment of dye contaminated natural water resources.; Journal of Industrial and Engineering Chemistry (2024). (Journal I.F= 6.1)



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### 4. Key note Address:

#### Dr. N C Dey

- Title of speech: “Coal washing – the need of the hour”; in a national seminar on Coal Washing in India: Challenges and Opportunities, organized by the registered Society, Millennium Institute of Energy & Environment Management in association with Coal Ash Institute of India at Hotel Holiday Inn, New Town, Kolkata on November 29, 2024.
- Plenary lecture on “Ergonomics intervention in Mining” in international conference HWWE 2024 held on 13-15 Dec 2024 in Science College Auditorium of Calcutta University.

#### Dr. P Dutta

- Session Chair, Greenhouse Gas Control Technology Conference, International Energy Agency, Lyon, France.

### 5. Receiving R&D project

- A study on controlled blasting pattern in a stone mine in India, 2022-24 (PI: Sudipto Mukherjee) – Ongoing

### 6. Important Events :

#### 6.1 Organized

- Dr N C Dey organized as Chairman All India Seminar on “Recent advances in Smart Mining Technologies and Resources” held on July 19 – 20, 2024 jointly with IE (I) in Kolkata.
- Dr N C Dey organized and acted as a Panelist in a Technical Webinar on “Smart Mining Technologies under man and machine interface” on 15.10.24, other two panelists were Dr Arindam Biswas Centre in charge IoT and AI integration of KNU university Asansol and Mr Darshan Deep Bhardwaj Dy Controller of Mines, IBM.

#### 6.2 Invitation

- Dr. G C Roy was Invited for a Training programme on “Extraction of pillars by caving method (Nevid angle) from panel 8&9 in R-VIIA seam by deploying low height continuous miner with shuttle car combination at 3&4 Incline Unit of Jhanjra Project Colliery”, jointly organised by Gainwell Commosales Private Limited (GCPL) and Eastern Coalfields Limited (ECL), December 2024.

#### 6.3 Participation

#### Dr. G C Roy

- International Workshop on Networking Women in Distributed Computing And Networks-2025

#### Dr N C Dey

- In the International Conference on HWWE 2024 “Ergonomics for everyone” in Science College, CU on Nov 13-15, 2024



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### 7. Honours:

#### Dr. N C Dey

- Performed as Guest of Honour in the national seminar “coal washing in India: Challenges and Opportunities” held on Nov 29, 2024 in Hotel Holiday Inn, Kolkata.
- Elected as MGMI Council member for the term of 2024-25
- Elected as All India Mining Div Board Chairman of IE(I) during 2021-25.

### 8. Other Imp Notes:

#### Dr. N C Dey

- Worked as Apex CIL R&D Board member during 2022-2024.
- Offered as Active Reviewer for IgMin-Research-STEM, (A Multi-disciplinary Journal) Sept 2024

### 9. Consultancy Project:

- Scientific study for monitoring of strata behavior and SCAMP preparation for depillaring with stowing of Panel S-11, S-12A, S-12B of Shyamsundarpur Colliery under Bankola Area. July 2024
- Scientific monitoring of dump and pit slope stability by determining FOS and pore pressure at CV area BCCL July 2024.
- Scientific study of Panel-C in Nimcha Highwall mining project Oct 2024.
- Scientific study and preparation of SCAMP for panel 21, R-IV Dishergarh seam of Satgram Incline June 2024
- Determining GCV of 31 coal samples through standard practice from WBPDCCL Kolkata Sept 2024.
- Scientific study for the development working in R-VIIA seam below and within 100m of Shankarpur Opencast Patch July 2024.
- Preparation and formulation of SCAMP based upon scientific study for depillaring Panel -20 in R-IV Dishergarh seam of Satgram Incline June 2024.
- Mixing of different proportion of Oxidized coal and fireclay with Seam IV, seam V & VI to achieve VM and GCV as desired by WBPDCCL June 2024.
- Scientific study for the extraction planning of Seams VIB and V at Damini Underground Mine, SECL (2024).
- Scientific study for Seam RIV MIC, JNR, ECL (2024).
- Scientific Study on Determination of Physico-mechanical properties of Coal and Coal Measure Rocks at Kuardih-Tirat Coal Block of Raniganj Coal field Area (2024).
- Instrumentation and Strata Monitoring of Continuous Miner Working During Development/Depillaring Operation in R-V Seam at Kumardihi-B Mine, ECL (2024).
- Instrumentation and Strata Monitoring of Continuous Miner Working During Development Panels at the R-V Seam of Jhanjra Project (2024).
- Instrumentation and Strata Monitoring of Continuous Miner Working During Development of Seam I (Top) at Gayatri Underground Mine, South Eastern Coalfields Limited (2024).



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- Instrumentation and Strata Monitoring of Low Height Continuous Miner Projects at Jhanjra 3&4 Incline in RVIIA and RVII Seams of Jhanjra Project Colliery, Eastern Coalfields Limited (2024).
- Instrumentation and Strata Monitoring of Low Height Continuous Miner Projects at Jhanjra 3&4 Incline in RVIIA and RVII Seams of Jhanjra Project Colliery, Eastern Coalfields Limited (2024).
- Design for Depillaring with CM and Shuttle Combination at B20 (Sub Panels B20A, B20B and B20C) in R-VI Seam at Khottadih Colliery, Pandaveswar Area, Eastern Coalfields Limited (2024).
- Scientific study for proposed CM Panels in RIV seam at Khottadih Colliery, Pandaveswar Area, Eastern Coalfields Limited (2024).
- Conducting 3rd Party Assessment of EC Compliance in Cluster V Group of Mines of BCCL, Bharat Coking Coal Limited (2024).
- Vetting of Temporary Mine Closure Plans for 6 UG Mines, Singareni Collieries Company Ltd. (2024).
- Verification work of final mine closure activities carried out for a coal mine, Dorli OC-II Expansion Project of SCCL, Singareni Collieries Company Ltd. (2024).
- Equilibration and analysis of the Coal from different mines (from CCO, Sambalpur), Mahanadi Coalfields Ltd. (2024).

### 10. PhD Supervision done

#### Dr. G C Roy

- Awarded: During Convocation 2024, Name of the student: Debapriya Mondal.



**Editorial Team**

**Dr. Gopal Chandra Dey,**

**Prof. Netai Chandra Dey**

**Md Imdadul Hoque, PhD Scholar**

**Arghadeep Hore, PhD Scholar**