



INDIAN INSTITUTE OF ENGINEERING SCIENCE AND TECHNOLOGY, SHIBPUR
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A photograph of a long, brightly lit hallway. On the left side, there is a long row of white lockers. On the right side, there are several arched doorways, some of which appear to be made of wood or a similar material. The floor is polished and reflects the overhead fluorescent lights. The hallway leads to a brighter area at the end.

A Biannual Newsletter (October-March, 2025)

DEPARTMENT OF MINING ENGINEERING

(Serving the nation since 1906)



Indian Institute of Engineering Science and Technology, Shibpur

An Institute of National Importance

भारतीय अभियांत्रिकी विज्ञान एवं प्रौद्योगिकी संस्थान, शिवपुर

It is with great enthusiasm this edition of 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.

ABOUT THE DEPARTMENT

With a keen focus on sustainable practices, safety, and environmental stewardship, faculty members are dedicated to tackling the industry's challenges through pioneering research, cross-disciplinary collaborations, and the cultivation of highly skilled professionals. Unwavering commitment of the department 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. The aim of the department is 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 the research initiatives, particularly in the field of mining safety and risk management.

The impactful advancements in mining technologies and safety protocols require the active collaboration of multiple stakeholders. At the Department of Mining Engineering, faculty members are 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.

Courses Offered

1. **B. Tech (Mining Engineering)**
2. **M. Tech (Mining Engineering)**
3. **Ph.D**

Thrust Area of Research

Rock slope engineering

Strata control

Carbon capture

Utilization and storage in geological media

AI/ Machine learning (ML) applications in mining processes

Mathematical modeling

Reserve estimation

IOT in mines

Biomining/bioleaching

Mine Waste to wealth

Extraction of metal from tailings/low grade ores

Environmental Pollution Control

Environmental Management in mines (EMP)

Environmental Impact Assessment (EIA)

Occupational Health & Safety

Ergonomic application in mining process

Coal and Metalliferous mining methods

Mining Machinery

Coal Quality Upgradation

Blasting in Mines

Coal/Mineral Processing

Honour received from Outside IEST

Dr N C Dey has been nominated by Ministry of Environment, Forest & Climate Change (MoEF & CC) as Member in the DPRC (Departmental Peer Review Committee) to consider promotion/upgradation of Scientist E to Scientist F and Scientist F to Scientist G on 27th Dec 2024.

Dr N C Dey was invited to give a *Plenary Lecture* in International Conference “HWWE 2024” at Meghnad Saha Bhavan of *Science College, Calcutta University* on Dec 13, 2024, the topic of my lecture is “Ergonomic application on Coal Miners to improve their work efficiency”.

Dr N C Dey was selected as *Co-Chairman in 39th Indian Engineering Congress* during Dec 20 – 22, 2024 in Novotel Hotel Newtown Kolkata organized by WBSC, IE (I).

In February 2025, Dr N C Dey was Co-opted as a member in the *national level committee* to consider necessary changes required for the DGMS First class and Second class managership examination during.

Dr N C Dey has been considered as *Expert in AICTE* for 2024-25 for evaluation of colleges merit for their registration in India.

Dr N C Dey was invited as *Guest of Honour* to give theme lecture on “Ergonomic Application to reduce Health care cost in industries” in Coal Washing in India: Challenges and Opportunities, organized by the Millennium Institute of Energy & Environment Management (MIEEM) in association with Coal Ash Institute of India (CAII) at Hotel Holiday Inn, New Town, Kolkata on November 29, 2024.

Dr N C Dey was invited to act as technical session Chairman in Mining and Metals on 21st Dec 2024 during 2.30 pm – 4.00 pm in room No 2, Lyon of Novotel Kolkata, organized by IE(I).

Dr N C Dey was invited lecture given at NIT Surathkal on 21st March 2025 on “Application of Ergonomics for industrial safety”.

Dr S. Mukhopadhyay has been nominated as **Member of the Advisory Board, National Library, by the Ministry of Culture, Government of India** vide Notification No. F. No. 10-9/2021-Lib, dated 3rd February, 2022 by the Ministry of Culture, Government of India.

Dr S. Mukhopadhyay has been nominated as **Visitor's Nominee of the Executive Council Central University of Odisha**, by the **Hon'ble President of India** in her capacity as the Visitor of Central University of Odisha, vide letter F. No. 55-1/2013-(Desk(U))dated 27.03.2024 **by the Ministry of Education, Government of India.**

Publication

Journal

Banerjee S and Dey N C (2024), Stochastic modeling of Continuous Miner based underground coal mine production planning through curve-fitting and regression approach, Acta Montanistica Slovaca, Volume 29(4), 1069-1084 SCI.

Kumar, D., Singh, K. and Mukhopadhyay, S; Innovative Strategies for Coal/Lignite Beneficiation with Progressive RAMDARS Technology Integration; Journal of Mines, Metals and Fuels, Vol. 72(3), 2024, pp. 235-242.

Muthaimanoj Periyasamy, Loganath Radhakrishnan, Utsav Sengupta, Sumanta Sain, Chandrasekar Pichandi, Sudipta Mukhopadhyay & Arik Kar; Phase transformation assisted reduction roasting of low-grade iron ore via industrial biomass as a reductant; Biomass Conversion and Biorefinery (October 2024), (Journal I.F=3.6).

Mondal, D., Garai, T., Roy, G. C. and Alam, S; Evaluating the nuclear power plant safety system under neutrosophic environment, Neutrosophic Sets and Systems, Volume 72, 2024, pp. 286-303.

Chowdhury, A. R., Bakshi, S. C., Pramanik, A. and Roy, G. C; Design and study of LoRa-based IIoT Network for Underground Coal Mine Environment, IEEE Access, Volume 13, 2025, pp. 4984-4995.

Conference

Dey N C (2025), “Ergonomic Intervention on specific mining operation” 3rd International Conf on Safe and Sustainable mining technologies, Organized by Indian Mining and Engineering Journal in association with NIT R, Jan 8–9 2025 in Bhubaneswar Odisha.

Kulshresth Singh, Ritik Agarwal, Sudipta Mukhopadhyay and Indrajit Banerjee, “Real-Time IoT Monitoring for Improved Air Quality Management in Mines”; in Proc. of International Conference on Mine Ventilation and Environment for Green Mining (MVEGM-2024), Puri, Odisha, IIT (ISM), Dhanbad, 20-22 December, 2024.

Bakshi, S. C., Roy, G. C., Saicharan, E. and Parvathi, E.; On Underground Mine Communication System, Proceedings of the 26th International Conference on Distributed Computing and Networking, Hyderabad India, January 4-7, 2025, pp. 307-312.

Bakshi, S. C., Pramanik, A., Roy, G. C. and Saicharan, E.; On IoT based Underground Mine Environment Monitoring Systems, Proceedings of the 26th International Conference on Distributed Computing and Networking, Hyderabad India, January 4-7, 2025, pp. 352-357.

Patent

Banerjee, I., Sinha, S., Ghorai, C., Sen, A., Chaudhari, M.P., Shome, D. S., Manekar, G.G., Mukhopadhyay, S., Singh, K. (2024) Real-time Remote Air Quality Monitoring System for Mining Area (Patent No. 558694). Date of Grant: 24/01/2025. Intellectual Property of India.

Ph.D submitted

Sri Dhananjay Kumar: Supervisor; Prof. S. Mukhopadhyay

Sri Kulshresth Singh: Supervisor; Prof. S. Mukhopadhyay

Ongoing R&D Project

A study on controlled blasting pattern in a stone mine in India: PI; Prof. S. Mukhopadhyay.

Events Organised by the Department

Special Lectures

Special Lecture on Tunnel Blasting, Speaker: Dr. Sujit Kumar Mandal, Former Senior Principal Scientist, Central Institute of Mining & Fuel Research (CIMFR), Dhanbad on January 29, 2025.

Invited lecture under CBDE (Capacity Building on Design and Entrepreneurship) on Geotechnical Engineering for Enhancing Mineral Reserves, Speaker: Dr. Srikant Annvarapu, Managing Director, Master Geotech Services Pvt. Ltd. on January 30, 2025.

Special Lecture on Opencast Blasting, Speaker: Dr. Sujit Kumar Mandal, Former Senior Principal Scientist, Central Institute of Mining & Fuel Research (CIMFR), Dhanbad on March 26, 2025.

Special Lecture on Rock Mechanics Principles and Numerical Simulation for Safe and Efficient Underground Mine Design, Speaker: Dr. Arka Jyoti Das, Senior Scientist, Central Institute of Mining & Fuel Research (CIMFR), Dhanbad on April 02, 2025.

Special Lecture on Wellbeing and Happiness, Speaker: Miss Sanjukta Acharya, Counselor, Indian Institute of Engineering Science and Technology, Shibpur on April 09, 2025.

Special Lecture on Explosives, Speaker: Dr. Sujit Kumar Mandal, Former Senior Principal Scientist, Central Institute of Mining & Fuel Research (CIMFR), Dhanbad on April 16, 2025.

Annual Student's Technical Meet

Organised "INTIUM 10.0: Just Transition from Coal" under the aegis of SOSMINE during March 07-08, 2025.

Felicitation of Director General

Organised felicitation ceremony to felicitated Sri Ujjwal Tah, Director General, DGMS, Dhanbad and Alumnus of IEST Shibpur (BE-1988).

Ongoing Consultancy Project

Analysis and interpretation of stress cell & multi point extensometer at T2 extension, T2C and T2A trench of HW Mining project of Sharda Opencast project, Minsol Pvt Limited

Scientific study for T2C and T2A trench in T2 Area of Sharda OCP Highwall extension working, Minsol Pvt Limited

Third party verification of the progressive mine closure activities of mines, Singareni Collieries Company Ltd.

Vetting of Temporary Mine Closure Plans for 6 UG Mines, Singareni Collieries Company Ltd.

Verification work of final mine closure activities carried out for a coal mine, Dorli OC-II Expansion Project, Singareni Collieries Company Ltd.

Equilibration and analysis of the Coal from different mines (from CCO, Sambalpur), Mahanadi Coalfields Limited.

Instrumentation and Strata Monitoring of Continuous Miner (CM-2) Working During Development of Panels at the R-V Seam of Jhanjra Project, Eastern Coalfields Limited and OS project of Gainwell Commosales Pvt. Ltd. (2025).

Instrumentation and Strata Monitoring of Continuous Miner Working During Development of Seam I (Top) at Gayatri Underground Mine, South Eastern Coalfields Limited and OS project of Gainwell Commosales Pvt. Ltd. (2025).

Study on the viability of surface subsided mining area for installation of solar power plant at Jhanjra Area, ECL (2025).

Study on the viability of surface subsided mining area for installation of solar power plant at Jhanjra Area, ECL (2025).

Study for formulation of SCAMP of two small parts of the mine at Khottadih Colliery, Pandaveswar Area, Eastern Coalfields Limited (2025).

Study for checking feasibility of mining operation in B17 Panel of R-VI seam at Khottadih Colliery, ECL and OS project of Coal Mines Associated Traders Pvt. Ltd. (2025).

Instrumentation and Strata Monitoring of Continuous Miner (CM-3 and CM-4) Working During Development of Panels at the R-V Seam of Jhanjra Project, Eastern Coalfields Limited and OS project of Resurgent Mining Solutions Pvt. Ltd. (2025).

Instrumentation and Strata Monitoring of Continuous Miner Working During Development/Depillaring Operation in R-V Seam at Kumardihi-B Mine, ECL and OS project of Gainwell Commosales Pvt. Ltd. (2025).