

HIGHLIGHT OF CAREER ACHIEVEMENTS AND FUTURE PLAN

Prof. Partha Sarathi Paul

PhD (IEST, Shibpur), M.E. (Mining), B.E. (Mining)
Post-doc from IIT, Kharagpur [CSIR-RA (Individual Scheme), 2006]

[Placed in Top 2% World Scientist as surveyed by Stanford University in 2021, 2023 & 2024]

Prof. Paul Joined the Institute in 2007

Designation : Professor
Department : Mining Engineering
Organisation : Indian Institute of Technology (Indian School of Mines), Dhanbad
Specialization : Occupational Health, Safety and Ergonomics;
Applied Multivariate Modeling and ML Techniques
Research Interest
a) Core Mining Discipline : Occupational Health, Safety and Ergonomics;
Applied Multivariate Modeling and ML Techniques in Mining Research;;
Interdisciplinary : Automation for Workplace Safety; Socio-economic Impact of Mining

Responsibilities :

a) Teaching Courses (Presently or Previously Taught For PhD, M.Tech & B.Tech Curriculum):

1. Research Methodology (**Mandatory Course for PhD Student**)
2. Risk and Workplace Safety Management (Full Paper for M.Tech)
3. Mining Equipment Reliability and Maintainability (Full Paper for M.Tech)
4. Advanced Safety Engineering (Full Paper for M.Tech)
5. Mine Safety Engineering (Full Paper as Open Elective for all discipline of B.Tech)
6. Mine Legislation & Safety (Full Paper for B.Tech)
7. Mine Development (Full Paper for B.Tech)
8. Mine Ventilation (Full Paper for B.Tech)
9. Mine Hazards and Rescue (Full Paper for B.Tech)
10. Advanced Mining Methods (Surface Mining section for B.Tech)
11. Occupational Health, Safety and Ergonomics Practical (For M.Tech)
12. Rock Mechanics Practical (For M.Tech)

b) Offered New Courses:

- (i) Research Methodology (For PhD Student)
- (ii) Advanced Safety Engineering (Full Paper for M.Tech)
- (iii) Risk and Workplace Safety Management (For M.Tech)
- (iv) Mining Equipment Reliability, Maintainability, and Availability (For M.Tech)
- (v) Mine Safety Engineering (Open Elective for all discipline of B.Tech)

(vi) Occupational Health, Safety and Ergonomics Practical (For M.Tech)

c) Development of New Teaching and

Research Laboratory in Current Position: Occupational Health, Safety and Ergonomics (OHSE) Laboratory (*funded by DST(SERB), IIT(ISM) & UCIL*)

d) Editorial Board Member of WoS SCIE Journal: Associate Editor, Mining, Metallurgy and Exploration, SME, USA

e) Details of Intellectual Properties (IP): One patent application will be submitted to IIT(ISM) in one month; Topic: Wireless IoT Based Underground Gas Monitoring and Communication Device

d) Administrative:

| Sl. No. | Section/ Office/ Institute level Committee | From | To | Responsibility |
|---------|---|-----------------|---------------------------|--|
| 1. | Faculty In-Charge, Newly Developed Occupational Health, Safety and Ergonomics (OHSE) Laboratory | 2019-20 | Continuing | To develop the State-of-art Mine Ergonomics Laboratory and carrying out research funded by external funding bodies. |
| 2. | Convener, DPGC | 28.11.2022 | 02.08.2023 | Looking after all M.Tech and Ph.D. curriculum of the Department. New Executive M.Tech in Geomatics courses has been approved during this period. |
| 3. | Coordinator, M.Tech (Mining Engineering) | 01.06.2020 | 31.05.2022 | To amalgam the course of M.Tech (Mining Engg. with multiple specialization) and M.Tech (Opencast mining) into M.Tech |
| 4 | Coordinator, M.Tech (Opencast Mining) | 05.04.2014 | 31.05.2022 | Started the new PG course since 2014-2015 Academic session. |
| 5. | Hostel Warden Opal Hostel, ISM, Dhanbad | 01.06.2013 | 31.05.2015 | To look after the daily student welfare in the Opal hostel |
| 6. | Member, Academic Council, ISM, Dhanbad | 16.07.2013 | 24.06.2016 | To take different academic decisions of Institute through academic council meeting. |
| 7. | Member, Departmental Research Committee (DRC) | 2012-13 | 2018-19 | To discuss and taking the decision of the Departmental R&D as well as PhD work. |
| 8. | Faculty In-Charge, Examination | 2010-11 session | 2013-14 session (Monsoon) | All the Departmental jobs related to examination. |

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|-----|---|-------------------|-------------------|--|
| 9. | Faculty In-Charge, CAMPAD Laboratory | 2008-2009 session | 2009-2010 session | Newly setting up of CAMPAD lab; Procurement of PC and software & its AMC. |
| 10. | Member Central Library, IIT (ISM), Dhanbad | 01.01.2008 | 30.06.2017 | Procurement of Books & Journals required for students, Research Scholar & Teachers |
| 11. | Member, Annual Sports Committee, ISM, Dhanbad | 2007-08 session | 2008-09 session | To organize the Institute Annual Sports |
| 12. | Faculty In-Charge, Time Table | 2007-08 session | 2010-11 session | Preparation of semester teaching time table. |
| 13. | Faculty Advisor, 3rd Year B.Tech (Mining) & Dual Degree | 2012-13 session | 2014-2015 session | To verify the semester registration form of students |
| 14. | In-Charge, Gas Testing Examination | 2007-08 session | 2009-10 session | Conducting Gas Testing Examination with DGMS students only. |

e) Educational Qualification:

| Sl. No. | Degree | Subject | Board/ University | Year | Division/ Class |
|---------|---|---|--|---------------------|-----------------|
| 1. | S.E. | General | W.B.B.S.E | 1992 | First |
| 2. | H.S. | Pure Science | W.B.C.H.S.E. | 1994 | First |
| 3. | B.E. | Mining | Indian Institute of Engineering Science and Technology, Shibpur (IEST, Shibpur) [formerly, Bengal Engineering College, Shibpur] | 1999 | First |
| 4. | M.E. | Mining | IEST, Shibpur | 2001 | First |
| 5. | Ph.D. in Engineering | Mining (Mine Safety Engineering) | IEST, Shibpur | 2006 | --- |
| 6. | Post-doctoral Research as CSIR Research Associates (RA)- Individual Scheme i.e. awarded own project | (Mine Safety Engineering) | Industrial & System Engineering, IIT Kharagpur | 2006 (seven months) | NA |

f) Employment: [particular of my past and present position(s)]

| Employer | Position held | Date of Joining | Date of Leaving | Pay with Scale of pay | Total Experience |
|--|---|------------------------|------------------------|--|--------------------------------|
| B. E. College (D.U). | Project Fellow | 02.07.2001 | 13.08.2002 | RS. 3,600/- (Consolidated) | 01 Year 01 Month |
| Bengal Engineering and Science University, Shibpur | Institute Ph.D. Scholar | 14.08.2002 | 13.08.2005 | RS. 5,000/- (Consolidated) | 03 Years |
| IIT Kharagpur | Research Associates (CSIR-Individual Scheme) | 03.04.2006 | 25.10.2006 | RS. 11,000/ (Consolidated) | 07 Months |
| Wirtgen India | Assistant Product Manager | 06.11.2006 | 31.12.2006 | Basic- Rs.9,000/- Gross-Rs. 25,000/ | 02 Months (Approx.) |
| Indian Institute of Technology (ISM), Dhanbad | Assistant Professor | 16.03.2007 | 25.06.2009 | PB- 3 with Rs.7,000/- as AGP | 02 Years 03 Months and 10 Days |
| Indian Institute of Technology (ISM), Dhanbad | Assistant Professor | 26.06.2009 | 05.09.2013 | PB- 3 with Rs.8,000/- as AGP | 04 Years 02 Months and 10 Days |
| Indian Institute of Technology (ISM), Dhanbad | Assistant Professor | 06.09.2013 | 05.06.2019 | PB-4 with Rs.9,000/- as AGP | 05 Years 09 Months |
| Indian Institute of Technology (ISM), Dhanbad | Associate Professor | 06.06.2019 | 23.02.2025 | Pay Level 13A2 in 7 th CPC Pay Matrix | 05 Years 09 Months |
| Indian Institute of Technology (ISM), Dhanbad | Professor | 24.02.2025 | Continuing | Pay Level 14A in 7 th CPC Pay Matrix | --- |

PROJECT/ THESIS

- ❑ **Research Associateship (Individual Scheme) sponsored by Council of Scientific and Industrial Research, India**

(Post Doctoral Research at IIT, Kharagpur)

An Application of Epidemiological Modelling of Underground Hazards – Role of Mine, Miner and Management Characteristics on Accident/Injury in Mines

[Supervisor: Prof. Jhareswar Maiti, Industrial & System Engineering, IIT, Kharagpur]

- ❑ **PhD**

Mine Safety Management – The Synergic Role of Personal and Sociotechnical Characteristics on Work Injuries in Mines

[Supervisor: Prof. Jhareswar Maiti, Industrial & System Engineering, IIT, Kharagpur]

(The general objective of the thesis is to develop the statistical indices for proper understanding of the Personal and Socio-technical factors leading to accident that may help to improve the personal safety of mine workers. The risk of occupational injuries to workers through the application of multivariate statistical models in mine accident evaluation and prevention has also been evaluated in this study.)

- ❑ **IN M.E.**

Evaluation of Work Posture and Workload Related to Different Operations in Underground Coal Mining

[Supervisor: Prof. N. C. Dey, Department of Mining Engineering, IEST, Shibpur]

(The Thesis mainly gives stress on postural related study in underground coal mines. The main focus was given on energy expenditure calculation for the miners of different mining operations and workload for the respective mining operations was also assessed to identify the nature of work.)

- ❑ **IN B.E.**

A Critical Study on Blasting Design for Indian Coal Mines

[Supervisor: Prof. N. C. Dey, Department of Mining Engineering, IEST, Shibpur]

(An attempt was made to focus on a different blasting design including some innovative methods, which are being gainfully utilizing in various coal mines. A thorough study was made on the blasting mechanics; blasting performance including controlled blasting technique enriched the project.)

RESEARCH:

A1. Research and Development Project Completed:

| Sl. No. | Title | Sponsor | Amount (In Rs.) | Duration |
|----------------------------|---|--------------------------|--------------------------|---------------------|
| 1. | An Investigation of Ergo-human Model to Evaluate the Functional Capacity of Coal Mine Workers | DST-SERB | 38.50739 lakhs (Approx.) | 3 years (Completed) |
| 2. | Study of assessment of personal exposure to Diesel particulate matter (DPM) for 7 diesel operated machines in underground workings of Jhanjra Project Colliery, ECL | Gainwell Commo Sales R&D | 5.9 lakhs | 01 Year (Completed) |
| 3. | Study of Hazards due to Mining Induced Sub-Surface Cavities and Waterlogged Areas in Inaccessible Old Workings in Underground Coal Mines Using Geophysical Techniques | CIL R&D | 199.96 lakhs | 3 years (Completed) |
| 4. | Design and Development of Knee and Spinal Smart Protective Devices for Improving the Health and Safety of Miners | CIL R&D | 72.06 lakhs (Approx.) | 2 years (Completed) |
| Total R&D Funds | | | 316.43 Lakh | |

B. I. Undergraduate Project Supervision: 51 Completed

II. Postgraduate Project Supervision: 17 Completed

Project/Dissertation Supervision of M. Tech (Mining Engineering/Opencast Mining)

| Sl. No. | Student Name | Session | Dissertation Title |
|---------|---|---------|--|
| 1. | Ashish Gupta Dual Degree M.Tech (Mining Engineering) | 2013-14 | Estimation of Accident Susceptibility of Underground Coal Mine Workers Using Logistic Regression Model |
| 2. | Siriboina Srinivasa Rao M.Tech (Opencast Mining) | 2014-15 | Estimation of Occupational Risk in Hard Rock Mine Using Loglinear Model |

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| 3. | Prasad Prabhat Kumar M.Tech (Opencast Mining) | 2015-16 | Estimation of Occupational Risk in Hard Rock Surface Mine Using Logit Model |
| 4. | Pradeep Kumar Sahu M.Tech (Opencast Mining) | 2015-16 | Optimum Utilization of Operating Parameters of Surface Miner Based on Pick Strength under Varied Rock Mass Condition. |
| 5. | Kapil Kumar M.Tech (Opencast Mining) | 2016-17 | Overburden Dump Slope Stability Analysis Using Numerical Methods – A Case Study |
| 6. | Gaurav Kumar M.Tech (Opencast Mining) | 2016-17 | Estimation of Occupational Risk in Hard Rock Surface Mine Using Logit Model |
| 7. | Lalit Kumar Meena Dual Degree M.Tech (Mining Engineering) | 2017-18 | Prediction of Backbreak During Bench Blasting Operation Using Neural Network |
| 8. | Anand Singh M.Tech (Opencast Mining) | 2017-18 | Slope Stability Analysis Using Sharma Method |
| 9. | Umesh Sahoo M.Tech (Opencast Mining) | 2017-18 | Reliability Analysis of Surface Miner and Shovel used in Indian Opencast Mines |
| 10. | Himadri Sekhar M.Tech (Mining Engineering) | 2018-19 | Stability Analysis of the Bord and Pillar Working under Overlying and Adjacent Caves Goves |
| 11. | Prashant Kumar M.Tech (Opencast Mining) | 2018-19 | Stability of Dump Slope using MATLAB |
| 12. | Vikram Sakinala M.Tech (Mining Engineering) | 2018-19 | Study of Work Postures and Estimation of Workload of Mine Workers related to Different Operations in Underground Mines |
| 13. | H Subrahmanyam Tharun | 2021-22 | Surface Course Improvement of Haul Roads in an Opencast Metalliferous Mines |
| 14. | Amit Kumar | 2022-23 | Determination of Stability of Coal Pillars using Discrete Fracture Network Modelling |
| 15. | Sourabh Anand | 2022-23 | Evaluation of Heat Stress to Mitigate the Occupational Health Hazards in Underground Coal Mines |
| 16. | Nitesh Kumar Rajwade | 2022-23 | Assessment of Noise and Its Impact on Human Health |
| 17. | Nijhum Das Chowa (from Bangladesh through ICMR) | 2023-24 | A Machine Learning Approach to Estimate the Role of Intrinsic Properties of Coal in Spontaneous Combustion Susceptibility |

**III. PhD Supervision: 12 Awarded (07 Sole Guide, 01 Main Guide, and 04 Co-guide),
15 Ongoing**

| C. | Details of PhD students (Guided and Ongoing) | | | |
|----------------|---|---------------------|---|--|
| Sl. No. | Name of Student(s) | Year | Title of the Dissertation(s) | Status (Completed / Ongoing) |
| 01 | Y. S. Dohare Regn. No. 2012DR0048 | Since 06.02.2012 | Development of a Wireless Low-Cost Surveillance and Safety System for Underground Mines Workers | Awarded on 08.02.2016 Role: Co-guide |
| 02 | Rajni Kant Regn. No. 2012DR1093 | Since 18.05.2012 | Development of a Planning Strategy for the Selection of Optimum Stoping Method for Hard Rock Mines | Awarded on 10.08.2017 Role: Co-guide |
| 03 | Falguni Sarkar Regn. No. 2012DR1058 | Since 01.05.2012 | An Investigation of Multivariate Statistical Models to Estimate the Risk and Risk Perception of Mine Workers in Underground Hard Rock Mines | Awarded on 11.10.2017 Role: Guide (Sole) |
| 04 | Manjunath. A Regn. No. 2014DR1000 | Since 20.09.2013 | Investigation of Environmental and Socio-economic Impact of Mine Closure with Reference to Kolar Gold Fields | Awarded on 04.09.2017 Role: Principal Guide |
| 05 | A. K. Dash Regn. No. 2013DR0249 | Since 24.07.2013 | Development of Accident Investigation Methodology for Indian Coal Mines | Awarded on 22.12.2017 Role: Co-guide |
| 06 | Aveek Mangal Regn. No. 2015DR1010 | Since 09.12.2014 | An Investigation of Multivariate Statistical Models to Estimate the Likelihood, Severity and Causation of Work Injury in Underground Coal Mines | Awarded on 20.03.2018 Role: Guide (Sole) |
| 07 | Deep Raj Regn. No. 2015DR0171 | Since 17.07.2015 | Analysis of Mercury in Soil, Coal and Fly Ash and Its Bioaccumulation in Plant and Phytoremediation by Brassica Juncea (L) Czern | Awarded on 17.12.2020 Role: Co-guide |
| 08 | Mr. Arka Jyoti Das Regn. No. 17DP000190 | Since 19.03.2017 | Investigation of Failure Mechanism and Strength Estimation of Inclined Coal Pillars | Awarded on 25.01.2022 Role: Guide (Sole) |
| 09 | Raja S. Regn. No. 2015DR1162 | Since 22.09.2015 | Investigation of Coal Mine Bump Hazards in Bord and Pillar Workings of Underground Coal Mines | Awarded on 05.09.2022 Role: Guide (Sole) |

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|----|---|---------------------|---|--|
| 10 | Mr. Shyamal Chandrakar Regn. No. 17DR000527 | Since 01.08.2017 | Assessment of Blast Design Parameters to Improve Advancement Factors in Parallel-hole Cut Blast Development Headings of Metalliferous Mines | Awarded on 12.05.2023 Role: Guide (Sole) |
| 11 | Mr. Paul Prasanna Kumar S. Regn. No. 17DP000316 | Since 29.08.2017 | Development of Wireless Real-time Gas Monitoring and Communication System Using IoT for the Safety of Underground Coal Mine Workers | Awarded on 12.01.2024 Role: Guide (Sole) |
| 12 | Sakinala Vikram Regn. No. 19DR0130 | August, 2019 | An Investigation of Multivariate Models to Evaluate the Synergic Role of Ergonomic Hazards on Occupational Health Risk of HEMM operators in Mines Using Machine Learning Algorithms | Awarded on 11.11.2024 Role: Guide (Sole) |
| 13 | Mukesh Vikram Regn. No. 17dr000635 | January, 2018 | Determinants of Spontaneous Combustion Propensity and Ignition Time of Indian Coal using Adiabatic Oxidation Method | Thesis submitted on January 28, 2025 (Under Evaluation) Role: Co-guide |
| 14 | John Gladius Regn. No. 18DP000357 | November, 2017 | Determinants of Influencing Parameters to estimate the Risk of Dump Slope Failure in Iron Ore mines at Goa Region | Thesis Write up Completed and waiting to get acceptance of required publication (Ongoing) |
| 15 | Himadri Sekhar Mahata Regn. No. 22DP0001 | August, 2022 | Development and Test of an Ergo-human model to Evaluate the Functional Capacity of LHD/SDL Operators in Underground Mines | Data collection and model development are going on Role: Guide (Sole) |
| 16 | Tripti Maurya Regn. No. 22dp0006 | August, 2022 | Investigation on thermal propensity of coal and Propagation of Fire in BCCL Mines | Works on research methodology applicable to her study Role: Co-guide |
| 17 | Avijit Bhunia 23DP0047 | January 2024 | An Investigation of human cardiovascular-cognitive model to estimate the degree of fatigue of Dumper Operators | Presently engage in completion of required course work Role: Guide (Sole) |

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|----|------------------------------------|------------------|---|---|
| 18 | Ayan Giri 23DP0048 | January 2024 | Development and Validation of RCA Based Accident Investigation Models to Estimate the Human as well as System Errors in Metalliferous Mines | Presently engage in completion of required course work Role: Guide (Sole) |
| 19 | Piyush Ranjan 23DP0073 | January 2024 | Subsurface Ventilation Network Simulation in Coal Mines using CFD Techniques | Presently engage in completion of required course work Role: Guide (Sole) |
| 20 | Siddharth Singh 23DP0097 | January 2024 | Human Modeling Approach to Assess the Work Posture of Mine Equipment Operators Using ML Techniques | Presently engage in completion of required course work Role: Guide (Sole) |
| 21 | AVIRUP PATRA 23DP0017 | January 2024 | Investigation of Proneness of Pulmonary Disease of Coal Mine Workers due to Physical and Cognitive Hazards | Presently engage in completion of required course work Role: Guide (Sole) |
| 22 | Mohnit Kumar Ghosh 23DP0026 | January 2024 | An Investigation of Multivariate Statistical Models to Estimate the Influencing Parameters for coal mine accidents based on the KG-DEMATEL-ISM-MICMAC Methodology | Presently engage in completion of required course work Role: Guide (Sole) |
| 23 | SHUVARTHY CHOWDHURY 24DP0012 | January 2024 | Development of Techno-economic Strategy towards Achieving Sustainable Development Goals of Mining Companies in Global Competition | Presently engage in completion of required course work Role: Guide (Sole) |
| 24 | CH VENKATESH 24DP0024 | February 2024 | Determinants of Health Hazards of Coal Mine Workers due to Exposure in Working Atmosphere Containing Diesel Particulates Matters (DPM) produced by HEMM | Presently engage in completion of required course work Role: Guide (Sole) |
| 25 | VYOMKESH KUMAR 24DP0053 | February 2024 | An Investigation of cardiopulmonary-human model to evaluate the functional capacity of rescue trained persons for carrying out rescue and recovery operations in underground coal Mines | Presently engage in completion of required course work Role: Guide (Sole) |

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|----|-------------------------------|------------|---|---|
| 26 | Rakesh Ranjan 24DP0185 | July, 2024 | An Investigation of Multivariate Statistical Models to Evaluate the Influencing Parameters of miners' unsafe acts based on HFACS-IM and SEM Methodology | Presently engage in completion of required course work Role: Guide (Sole) |
| 27 | Rup Kumar Bengani 24DP0187 | July, 2024 | Determinants of Musculo-Skeletal Disorders (MSDs) of Opencast Coal Mine HEMM Operators due to Whole Body Vibration using ML Techniques | Presently engage in completion of required course work Role: Guide (Sole) |

| D. | Books / Monographs / Book Chapter(s) Written | | | |
|---------|--|--|---------------------|--|
| Sl. No. | Name of Book/Monograph/Book | Name of the Co-Author(s), if any | Year of Publication | Publisher with address |
| 01 | Edited a National Seminar Proceeding of "Disaster in Mines" | Prof. U. K. Singh | 2008 | Indian School of Mines |
| 02 | Edited Short Term Course Volume on "Safety Engineering and Management in Coal Mines" | Prof. S. Chaudhuri | 2013, 2014 & 2015 | Indian School of Mines |
| 03 | "Determinants of Risk Indices in Hard Rock Mine Using Log Linear Model"; Published as book chapter (Chapter 7) of Springer Nature Book - J. Maiti and P.K. Ray (eds.), Industrial Safety Management, 21st Century Perspectives from Asia | Paul, P. S., Mangal, A. and Sarkar Falguni | 2018 | Purnendu Mandal, College of Business, Lamar University, Beaumont, TX, USA © Springer Nature Singapore Pte Ltd. 2018 https://doi.org/10.1007/978-981-10-6328-2_7 |

| E. | Seminar(s) / Short Term Course(s) / Summer School(s) / Winter School(s) Organized | | | | |
|---------|---|------------|---|--|-----------------------------|
| Sl. No. | From | To | Name of the Course(s) | Sponsored by / Self Financed | Number of Participants |
| 01 | 08.03.2008 Seminar | 09.03.2008 | Seminar on "Disaster in Mines" as Co-Convener | CIL & its Subsidiaries, Tata steel, SAIL, etc. | 44 Delegates (5.5 Lakh) |
| 02 | 26.11. 2012 Short Course | 07.12.2012 | "Mine Legislation & Related Issues" in the capacity of Co-Consultant In-charge | Deptt. of Atomic Energy, Govt. of India | 18 Participants (7.86 Lakh) |

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| 03 | 24.06.2013 Short Course | 28.06.2013 | "Safety Engineering and Management in Indian Coal Mines" in the capacity of Consultant In-charge | CIL & its Subsidiaries, Tata steel, SAIL, etc. | 22 Participants (7.35 Lakh) |
| 04 | 23.06.2014 Short Course | 28.06.2014 | "Safety Engineering and Management in Indian Coal Mines" in the capacity of Consultant In-charge | CIL & its Subsidiaries, Tata steel, SAIL, etc. | 24 Participants (8.17 Lakh) |
| 05 | 06.07.2015 Short Course | 15.07.2015 | "Development of Risk Based Safety and Health Management Plan in Indian Mines" as Member | CIL & its Subsidiaries, NMDC, SAIL, etc | 23 Participants (11.10 Lakh) |
| 06 | 17.08.2015 Short Course | 21.08.2015 | "Safety Engineering and Management in Indian Coal Mines" in the capacity of Co-Consultant In-charge | CIL & its Subsidiaries, Tata steel, SAIL, etc. | 22 Participants (7.57 Lakh) |
| 07 | 04.07.2022 | 09.07.2022 | "Advances in Mining Technology and Safety Management Practices in Indian Mines and Oil Fields" for newly recruited officers of DGMS in the capacity of Co-Consultant In-charge | Director General of Mines Safety (DGMS) | 36 (6,80 Lakh) |
| 08 | 01.08.2022 | 06.08.2022 | "Investigation into Accidents/Incidents in Mines Based on Root Cause Analysis Techniques" for Officers of Adani Natural Resources in the capacity of Co-Consultant In-charge | Adani Natural Resources | 25 (5.90 Lakh) |
| 09 | 17.10.2022 | 22.10.2022 | "Investigation Into Accidents / Incidents in Mines Based on Root Cause Analysis Techniques" for Officers of Coal India Limited in the capacity of Co-Consultant In-charge | Coal India Limited (CIL) | (22) (8.26 Lakh) |
| 10 | 07.11.2022 | 12.11.2022 | "Investigation Into Accidents / Incidents in Mines Based on Root Cause Analysis Techniques" for Officers of Coal India Limited in the capacity of Co-Consultant In-charge | Coal India Limited (CIL) | (22) (8.26 Lakh) |
| 11 | 14.11.2022 | 19.11.2022 | "Investigation Into Accidents / Incidents In Mines Based on Root Cause Analysis Techniques" for Officers of Coal India Limited in the capacity of Co-Consultant In-charge | Coal India Limited (CIL) | (22) (8.26 Lakh) |
| 12 | 13.02.2023 | 18.02.2023 | "Investigation Into Accidents / Incidents in Mines Based on Root Cause Analysis Techniques" for Officers of Coal India Limited in the capacity of Co-Consultant In-charge | NLC India Ltd. | (25) (5.66 Lakh) |

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|----|---------------------------------|--------------------------|--|--------------------------|----------------------|
| 13 | 24.07.2023 | 29.07.2023 | “Investigation Into Accidents / Incidents in Mines Based on Root Cause Analysis Techniques” for Officers of Coal India Limited in the capacity of Co-Consultant In-charge | Coal India Limited (CIL) | (22) (8.26 Lakh) |
| 14 | 07.08.2023 | 12.08.2023 | “Investigation Into Accidents / Incidents in Mines Based on Root Cause Analysis Techniques” for Officers of Coal India Limited in the capacity of Co-Consultant In-charge | Coal India Limited (CIL) | (22) (8.26 Lakh) |
| 15 | 13.02.2024 | 18.02.2024 | “Investigation Into Accidents / Incidents in Mines Based on Root Cause Analysis Techniques” for Officers NLC and Tata Steel in the capacity of Co-Consultant In-charge | NLC and Tata Steel | (22) (7.79 Lakh) |
| 16 | 04.03.2024 | 08.03.2024 | Auditing of Safety Management System and Accident Investigation in Mines Based on Root Cause Analysis in the capacity of Co-Consultant In-charge | DGMS Officers | (32) (14.75 Lakh) |
| 17 | 03.06.2024 | 08.06.2024 | Training on Safety Management Safety Audit for Executives of BCCL (Batch 1) in the capacity of Co-Consultant In-charge | BCCL | (28) (17.70 Lakh) |
| 18 | 17.06.2024 and 25.06.2024 | 19.06.2024 27.06.2024 | Training on Safety Management Safety Audit for Executives of BCCL (Batch 2) in the capacity of Co-Consultant In-charge | BCCL | (28) (17.70Lakh) |
| 19 | 01.07.2024 | 05.07.2024 | Auditing of Safety Management System and Accident Investigation in Mines Based on Root Cause Analysis in the capacity of Co-Consultant In-charge | DGMS Officers | (32) (14.75 Lakh) |
| 20 | 10.07.2024 and 15.07.2024 | 12.07.2024 17.07.2024 | Training on Safety Management Safety Audit for Executives of MCL in the capacity of Co-Consultant In-charge | MCL | (28) (15.34 Lakh) |
| 21 | 29.07.2024 | 03.08.2024 | Training on Safety Management Safety Audit for Executives of WCL in the capacity of Co-Consultant In-charge | WCL | (32) (14.75 Lakh) |
| 22 | 19.08.2024 | 24.08.2024 | Training on Safety Management Safety Audit for Executives of ECL in the capacity of Co-Consultant In-charge | ECL | (34) (15.34 Lakh) |
| 23 | 26.08.2024 | 31.08.2024 | Training on Safety Management Safety Audit for Executives of SECL in the capacity of Co-Consultant In-charge | SECL | (34) (21.24 Lakh) |

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| 24 | 09.09.2024 | 14.09.2024 | Training on Safety Management Safety Audit for Executives of NCL in the capacity of Co-Consultant In-charge | NCL | (32) (14.75 Lakh) |
| 25 | 30.09.2024 | 05.10.2024 | Training on Safety Management Safety Audit for Executives of CCL in the capacity of Co-Consultant In-charge | CCL | (26) (11.80 Lakh) |
| 26 | 21.10.2024 | 26.10.2024 | Training on Safety Management Safety Audit for Executives of SECL in the capacity of Co-Consultant In-charge | SECL | (36) (22.65 Lakh) |
| Total Outreach | | | | | 286.51 Lakh |
| <i>Series of Short Courses are conducted through out the year on 'Mine Safety'</i> | | | | | |

| F1. Sponsored Consultancy Project(s) Completed | | | | | |
|---|---|--|---------------|----------------|--|
| <i>Sl. No.</i> | <i>Sponsoring Agency</i> | <i>Title of the Project(s)</i> | <i>Period</i> | <i>Amount</i> | <i>Status</i> |
| 1. | UCIL | Conducting Vibration Studies and Ergonomical Assessment of HEMM Operators (As per ISO Standards) of Eight (8) Mines of UCIL Consultancy No: CONS/6006/2020-21 | 2020-2022 | 23.60 lakhs | Completed as Consultant In-charge |
| 2. | Odisha Mining Corporation (OMC) Limited | Safety Audit of all Working Mines (Seven Mines) of Odisha Mining Corporation Ltd. Consultancy No: CONS/4039/2018-19 | 2018-2020 | Rs.18,17,200/- | Completed as Consultant In-charge |
| 3. | UCIL | Scientific study to Establish Controlled Blast Design Parameters vis-à-vis Safety within 100m of Occupied Buildings at Banduhurang Opencast Mines, UCIL. Consultancy No: CONS/3842/2018-19 | 2018-19 | Rs.4,74,696/- | Completed as Consultant In-charge |
| 4. | BCCL | Scientific Study for fixing blasting parameters for the OC patch at Nichitpur Colliery, BCCL; Consultancy No: CONS/0720/08-09 | 2008-09 | Rs.1,95,522/- | Completed As Member |
| 5. | Hindustan Copper Ltd. | Field investigation, modeling and simulation studies for redesigning and reorganizing the ventilation systems for improving the under-ground environment in Khetri Mine, and Kolihan Mine of Hindustan Copper Limited. Consultancy No: CONS/0522/08-09 | 2008-09 | Rs. 8,76,408/- | Completed As Member |

| | | | | | |
|--------------------------------|-----------------------------------|---|---------|-------------------|---------------------|
| 6. | India Resources Ltd. | Field investigations, modelling and simulation studies for designing and reorganizing the ventilation system for improving the workplace environment in Surda Mine, India Resources Ltd. Consultancy No: CONS/0408/2007 | 2007-08 | Rs. 6,51,688/- | Completed As Member |
| 7. | M/s Suparna Chemicals Ltd, Mumbai | A study of performance and behaviour of self-contained self rescuers as per EN 401 (European Norms) 401 and determination of rated duration of the ready to use apparatus of M/s Suparna Chemicals Ltd, Mumbai. Consultancy No.: CONS/0380/2007 | 2007-08 | Rs. 7,97,760/- | Completed As Member |
| 8. | ECL | Field Investigations modelling and simulation studies for amalgamation of Jhanjra Project Mine and 3 & 4 Incline Mine, Jhanjra Area. Consultancy No.: CONS/0380/2007 | 2007-08 | Rs. 3,36,720/- | Completed As Member |
| Total Consultancy Value | | | | 75.10 Lakh | |

| G. | Membership of Professional Body/Bodies | | |
|----------------|---|---------------------------------|-----------------------|
| <i>Sl. No.</i> | <i>Name of the Professional Body/Bodies</i> | <i>Grade of the Body/Bodies</i> | <i>Valid upto</i> |
| 1. | Society of Mining Engineers (SME), USA | Professional member | December 31, 2025 |
| 2. | Institute of Engineers | Fellow | Life Member |
| 3. | MGMI Kolkata, India | MMGI | Life Member |
| 4. | Mining Engineers Association | MMEAI | Life Member |
| 5. | Indian Mining and Engineering Journal | Life Member of IM&EJ | Life Member |
| 6. | Indian Society of Ergonomics | Member | Life Member (Applied) |

H. Evaluation of Ph.D. Thesis as External Examiner (India and Abroad)

1. **The Ph.D. thesis entitled** “A Mixed Method Investigation of Injuries Associated with Artisanal and Small-Scale Mining in Migori County, Kenya’ submitted by **Michael Mayom Ajith** to **Curtin University, Australia in 2020**
2. **The Ph.D. thesis entitled** “Investigation and Assessment of Quality of Bricks Prepared Using Iron Ore Waste” submitted by **Shreekanth Revachand Lamani** to **NITK Surathkal, India in 2017**
3. **The Ph.D. thesis entitled** “Evaluation of Human Body Vibration in Indian Surface Coal Mines and Prediction of Health Risk Based on Health Guidance Caution Zone (HGCZ)” submitted by **Jeripotula Sandeep Kumar** to **NITK Surathkal, India in 2020**
4. The Ph.D. thesis entitled “Ergonomic assessment of work posture and evaluation of hand arm vibrations in underground mines” submitted by **Sridhar S.** to **NITK Surathkal, India in 2023**

I1. Editorial Board Member of Reputed WoS Journal

Associate Editor, Mining, Metallurgy and Exploration Journal, SME, USA

I2. Reviewer of Reputed Journals

Reviewed research articles invited from several reputed journals throughout the year. Some of the reputed journals are mentioned hereunder:

1. Journal of Industrial Ergonomics, WoS SCIE Journal
2. Applied Ergonomics, WoS SCIE Journal
3. Ergonomics. Taylor & Francis, WoS SSCI Journal
4. Institute of Engineers, India, Series D, Springer, WoS SCI Journal
5. Accident Analysis and Prevention. Elsevier, WoS SSCI Journal
6. Safety Science, Elsevier, WoS SCIE Journal
7. Health & Safety at Work, WoS SCIE Journal
8. Journal of Occupational Safety and Ergonomics
9. Scientific Reports, Springer, WoS SCI Journal
10. Mining, Metallurgy and Exploration, Springer, WoS SCI Journal
11. Tunneling and Underground Space Technology
12. Scientific Reports, Springer, WoS SCI Journal
13. International Journal of Injury Control and Safety Promotion
14. Current Science, WoS SCIE Journal
15. Journal of the Geological Society of India, WoS SCIE Journal
16. IAMURE International Journal of Ecology & Conservation, Thompson Reuters Index Journal
17. Journal of Scientific Research, Scopus Index Journal
18. Journal of Mines, Metals and Fuels, India, Scopus Index Journal

I ANY OTHER RELEVANT INFORMATION

| Ia | Delivered Invited Talk and Seminar(s) / Short Term Course(s) / Summer School(s) / Winter School(s) attended, if any | | | | |
|---------|---|------------|---|----------------------|--|
| Sl. No. | From | To | Institute / Industry | Sponsored by | Name of the Course(s) |
| 1. | 19.07.2024 | 20.07.2024 | West Bengal State Centre, IE(I) Under the aegis of Mining Engineering Division Board, IE(I) in association with Department of Mining Engineering, IEST Shibpur | IIT (ISM) Dhanbad | attend & present an oral research paper in All India Seminar on 'Recent Advances in Smart Mining Technologies and Resources' |
| 2. | 24.06.2023 | 26.06.2023 | BIT Mesra, Jharkhand | INAE-SERB, New Delhi | Participated to deliver an invited talks on "Estimation of Whole-Body Vibration of Opencast HEMM Operators using ML Techniques" in the occasion of INAE-SERB conclave at BIT Mesra. |
| 3. | 21.02.2020 | 22.02.2020 | VNIT Nagpur | VNIT Nagpur | To attend as well as present a research paper in the National Seminar on RPAMI held at Dept of Mining Engineering, VNIT, Nagpur |
| 4. | 24.01.2017 | 26.01.2017 | Department of Mining Engineering, IIT, Kharagpur | IIT (ISM) Dhanbad | International Conference on "Deep Excavations, Energy resources & Production (DEEP16) |
| 5. | 23.02.2016 | 26.02.2016 | MGMI, Kolkata | ISM, Dhanbad | 6th Asian Mining Congress |
| 6. | 29.01.2015 | 30.01.2015 | ISM alumni Association, Kolkata Chapter. | ISM, Dhanbad | International conference on Mine Health and Safety Management |
| 7. | 10.01.2014 | 11.01.2014 | Department of Mining Engineering, I.S.M., Dhanbad held at Hotel Taj Bengal, Kolkata. | ISM Dhanbad | National Seminar on "Surface Mining" (NSSM). |
| 8. | 07.12.2012 | 07.12.2012 | Choice Group of Institute in association with Different Global organizations held at Bayview Hotel, SINGAPORE | ISM Dhanbad | International Research Symposium on "Interdisciplinary Approaches in Management, Engineering and Technology". |
| 9. | 27.09.2012 | 28.09.2012 | Sankardev College, Shillong, held at Shillong, Meghalaya. | ISM Dhanbad | National Seminar on "Mining: Impact Assessment on Ecology, Technology, Polity and Society". |
| 10. | 16.01.2012 | 20.01.2012 | Under the Scheme "National Program for Training of Scientists and Technologists working in Government Sector" held at ISM | DST, GOI, New Delhi | Training on "A Primer on Geostatistics" |
| 11. | 13.10.2011 | 15.10.2011 | Department of Mining Engineering, I.S.M, Dhanbad held at Puri. | ISM Dhanbad | National Seminar on "Underground Metal Mining: Status and Prospects". |
| 12. | 04.12.2009 | 06.12.2009 | Institute of Engineers (India), Udaipur Local Centre and Mining Engineers' Association of India, Rajasthan Chapter, held at Udaipur, Rajasthan. | ISM Dhanbad | 21st NCME and National Seminar on "Technological Advancements in Mining Industry". |
| 13. | 10.11.2009 | 13.11.2009 | Department of Mining Engineering, Indian School of Mines, Dhanbad held at New Delhi. | ISM Dhanbad | 9 th International Mine Ventilation Congress (9 th IMVC) |
| 14. | 18.05.2009 | 22.05.2009 | Centre for Management Studies, The University of Burdwan | ISM Dhanbad | Short Term Course on " Research Methodology (Multivariate Data Analysis) " |
| 15. | 12.03.2008 | 11.03.2008 | Mining Engineering Division, Dhanbad Local Centre, Institute of Engineers in association with the Department of Mining Engineering, I. S. M. University, Dhanbad held at ISM. | ISM Dhanbad | 19th NCME and National Seminar on "Disaster in Mines" (DM- 2008). |
| 16. | 23.11.2001 | 24.11.2001 | Department of Mining Engineering, B.E. College (D.U), Howrah held at B.E. College (D.U), Howrah. | B.E. College Howrah | National Seminar on Problems & "Prospects of Bord and Pillar Mining in the New Millennium" |
| 17. | 23.02.2001 | 24.02.2001 | Department of Mining Engineering, Regional Engineering College, Rourkela held at Rourkela. | Self-financed | National Seminar on "Environmental Issues and Waste Management in Mining and Allied Industries" (EWM- 2001). |

Ib. Special Lecture Delivered (Executive Development Programme) by Dr. Partha Sarathi Paul, Associate Professor, Mining Engineering, IIT (ISM), Dhanbad

| Subject Area | Duration of Course | Institution/Organisation joined this programme | Academic Session/Dates | No of sessions engaged (One Session = 1½ hours) |
|---|---------------------------|--|---------------------------------------|--|
| Mine Environment, Rescue & safety | 14 Weeks | TISCO | July, 2007-October, 2007 | 04 |
| Mine Disaster | 01 Week | IMM, BCSIR, Bangladesh | September 19, 2008 to October 3, 2008 | 01 |
| Drilling Technology | 01 Week | NHPC | January 27-31, 2009 | 02 |
| Drilling Technology | 01 Week | NHPC | June 22-26, 2009 | 01 |
| Drilling Technology | 01 Week | NHPC | September 1-3, 2011 | 01 |
| “Mine Safety & Disaster Management” | 04 Weeks | Management trainees (Mining) of Hindustan Zinc Limited | September 17, 2012 - October 13, 2012 | 02 |
| “Mine Safety & Disaster Management” | 04 Weeks | Management trainees (Mining) of Hindustan Zinc Limited | July 09, 2012 - August 04, 2012 | 02 |
| Mine Safety Engineering, Mine Legislations, etc. | 02 Weeks | Scientist of Atomic Energy, Govt. of India | November 26, 2012 – December 07, 2012 | 04 |
| Risk Management in Tunneling | 01 Week | NHPC | 2012-2013 | 01 |
| Mine Safety | 03 Days | CIL and its Subsidiaries, Tata Steel, SCCL, etc. | February 21, 2013 - February 23, 2013 | 01 |
| Safety Engineering and Management in Coal Mines | 01 Week | CIL and its Subsidiaries, Tata Steel, SCCL, SAIL, etc. | June 24 – June 28, 2013 | 07 |
| Risk Management in Mines | 02 Weeks | Officers from Govt. of AFGHANISTAN (International Executives) | September, 2013 | 02 |
| Safety Engineering and Management in Coal Mines | 01 Week | CIL and its Subsidiaries, Tata Steel, SCCL, SAIL, etc. | June 23 – June 28, 2014 | 07 |
| Risk Based Safety and Health Management System in Mines | 02 Weeks | Hindalco Industries Limited | July 03-17, 2024 | 03 |

Ib. Special Lecture Delivered (Executive Development Programme) by Dr. Partha Sarathi Paul, Associate Professor, Mining Engineering, IIT (ISM), Dhanbad (Contd.)

| Subject Area | Duration of Course | Institution/Organisation joined this programme | Academic Session/Dates | No of sessions engaged (One Session = 1½ hours) |
|--|------------------------|---|--|--|
| Environmental Risk Management | 02 Weeks | Officers from Govt. of AFGHANISTAN (International Executives) | 6 th December 2014- 22 nd December 2014 | 02 |
| Safety Engineering and Management in Coal Mines | 01 Week | Officers from CIL, Tata Steel, SCCL, etc. | August 17 – August 21, 2015 | 07 |
| Training Course on Mining Equipment Safety Practices | 3 Days | Officers from SCCL, NLC, Tata Steel, etc. | December 7-9, 2015 | 02 |
| Legislations regarding Mining Equipment for executives of E&M Cadre of CIL | 5 Weeks | Offices from CIL Executives (Mechanical, Electrical, and Civil Engineers) | 2016 | 02 |
| Mining and Environment | 9 Days | For non-mining executives working in mines | August 1-8, 2016 | 02 |
| Training Course on Mining Equipment Safety Practices | 3 Days | Officers from SCCL, NLC, Tata Steel, etc. | November 7-9, 2016 | 02 |
| Legislations regarding Mining Equipment for executives of E&M Cadre of CIL | 5 Weeks | Offices from CIL Executives (Mechanical, Electrical, and Civil Engineers) | December 19, 2016 – January 21, 2017 | 02 |
| Development of Risk Based Safety and Health Management Plan in Indian Mines | 02 Weeks | CIL & its Subsidiaries, NMDC, SAIL, etc | July 06-15, 2015 | 05 |
| Advances in Mining Technology and Safety Management Practices in Indian Mines and Oil Fields | 01 Week | Officers of Director General of Mines Safety (DGMS) | July 4-9, 2022 | 04 |
| Investigation into Accidents/Incidents in Mines Based on Root Cause Analysis Techniques | 01 Week | Officers of Adani Natural Resources | August 1-6, 2022 | 04 |
| Investigation into Accidents/Incidents in Mines Based on Root Cause Analysis Techniques | 01 week for each batch | Officers of CIL & its subsidiaries | 10 batches during 2022-23, 2023-24 & 2024-25 Sessions so far | 04 class in each batch x10= 40 |

| | | | | |
|---|----------|--|--------------------------------------|---------------------|
| Investigation Into Accidents / Incidents in Mines Based on Root Cause Analysis Techniques | 01 Week | Officers of NLC India Ltd. | February 13-18, 2023 | 04 |
| Auditing of Safety Management System and Accident Investigation in Mines Based on Root Cause Analysis | 01 weak | Officers of Director General of Mines Safety (DGMS | Two Batches during 2023-24 & 2024-25 | 08 |
| Risk Based Safety and Health Management System in Mines | 02 Weeks | Hindalco Industries Limited | July 03-17, 2024 | 03 |
| Total | | | | 125 Sessions |

Ic. Significant Academic Contributions in my Present Institution [IIT (ISM), Dhanbad]

Significant Academic Contributions are as follows:

- **Published one of the top cited research papers [Citation: 346 dt. 28.10.2024] in SCI and WoS JCR Q1-index journal (Safety Science; I.F:6.2) from India in the research domain of Mining Engineering.**
- **The citation of all published research articles is 1177 as on 28.10.2024 with h-index:17, and i10 index:23**
- **Associate Editor, Mining, Metallurgy and Exploration, SME, USA (WoS JCR Q2 Journal)**
- **Examined one PhD Thesis entitled “A Mixed Method Investigation of Injuries Associated with Artisanal and Small-Scale Mining in Migori County, Kenya” submitted to Curtin University (QS Ranking 02 in Mineral & Mining) in 2020**
- **Published 22 papers in different SCI/SCIE/SSCI (WoS JCR Q1/Q2/Q3/Q4 based on Impact Factor) Index International Journal. Several numbers of research papers either are under Review or are in communication stage.**
- **Guided 12 PhD (08 as Sole & Principal supervisor Awarded & 04 as Co-supervisor) so far, 14 scholars are presently guiding.**
- **Developed New “Occupational Health, Safety and Ergonomics” Laboratory in the Department which will open a new window of teaching and research in the domain of System safety engineering particularly applicable to Mines [Sanctioned amount: Rs.39 lakhs (Approx.) by DST (SERB) for a R&D Project, Rs.23.60 lakhs by UCIL for a Consultancy Project, and 35 lakhs (Approx.) by IIT (ISM)].**
- **Visited SIMTARS, Department of Natural Resources, Mines and Energy (DNRME) and University of Queensland (UQ), Australia in 2019 for getting exposure to the modern technology and seeking research opportunity in collaboration with them in the area of Mine Safety and Ergonomics.**
- **Visited an Anglo-American company operated Australian Fully mechanized underground coal mines in March, 2019.**
- **Published a book on “Disaster in Mines” as an edited volume.**
- **contributed a book chapter (Chapter 7) of Springer Nature Book - J. Maiti and P.K. Ray (eds.), Industrial Safety Management, Managing the Asian Century, © Springer Nature Singapore Pte Ltd. 2018 https://doi.org/10.1007/978-981-10-6328-2_7.**
- **Organized fifteen Short Term Courses on “Occupational Health and Safety in mines” for practicing Mining Engineers of Middle to top management in CIL & its Subsidiaries, SAIL, SCCL, Tata Steel, DGMS, and Scientist of Atomic Energy, Govt. of India, respectively.**
- **Newly Introduced “Mine Safety Engineering” as Elective Paper for final year B. Tech (Mining Engineering)/ other discipline students, “Advanced Mine Safety Engineering” and “Risk and Workplace Safety Management” for M.Tech (Mining Engineering) courses, and Research Methodology and Statistics for Ph.D. students of the Department of Mining Engineering, IIT(ISM) Dhanbad.**
- **Established and developed NEW CAMPAD laboratory through amalgamation of System Engineering Lab and CAMPAD Lab in the Department (including procurement & regularization of AMC of modern Mining Softwares),**
- **Appointed as Reviewer from several WoS SCI/SCIE/SSCI JCR Q1/Q/Q3/Q4 Journals throughout the years.**
- **Chairing a Technical Session of an International Research Symposium on Interdisciplinary Approaches in Management, Engineering and Technology held in Singapore during December 07-08, 2012.**
- **Presented one of my research paper entitled “Safety in Indian Coal Mines – Where Do WE Go from Here” in an International Research Symposium on Interdisciplinary Approaches in Management, Engineering and Technology held in Singapore during December 07-08, 2012**
- **Carried out several Consultancy Projects in the capacity of Consultant In-charge, Co-Consultant In-charge and Member.**
- **Delivered special lectures (approximately 125 Sessions) in different Executive Development Programmes for practicing Mining Engineers, Geologists, Civil Engineers, Mining Supervisors, etc.**
- **Empaneled as a Subject Expert in different States’ PSC and SSC interview and Examination Board in India**
- **Nominated as Expert Member of the Selection Committee Meeting for the appointment and Promotion Technical Officer at CIMFR, Dhanbad.**
- **Nominated as Expert Member of the Selection Committee Meeting for the appointment of Project Assistant at CIMFR, Dhanbad.**
- **Examined and conducted PhD viva-voce examination as Indian Examiner of three PhD Thesis in the Department of Mining Engineering, NITK, Surathkal in 2017, 2021, and 2024.**

MODE OF CLASSROOM TEACHING

1. Preferred Chalk Board Teaching.
2. Always like to draw the different technical diagrams on the board during classroom teaching.
3. Always open up myself to the students to receive their doubts inside and outside the classroom.
4. Taking schedule classes regularly since my joining to the IIT (ISM), Dhanbad.

DEVELOPMENT OF NEW LABORATORY

Established New State-of-Art Occupational Health, Safety and Ergonomics Laboratory in the Department of Mining Engineering, IIT(ISM) funded by DST (SERB) [R&D project], IIT/(ISM) Dhanbad and also from UCIL through industrial consultancy in Ergonomics project. This Research Laboratory is now serving as Teaching Laboratory both for PG [MTech in Mining engineering) & MTech in TUST] & UG Level [B.Tech (Hon.) in Mining Engineering] for the Course(s) “Health, Safety and Ergonomics” and “Mine Hazards and Safety”, respectively.

TECHNICAL CONCEPTS AND MODELS DEVELOPED BASED ON THE RESEARCH DONE IN THE AREA OF “OCCUPATIONAL HEALTH, SAFETY AND ERGONOMICS”

1. Working in the area of Mine Health Safety and Ergonomics since 2000.
2. Self-regulations for Industrial safety are the most important concept which I have developed along with the other researchers in the Country.

Based on Self Regulations, I developed the following Models in interdisciplinary areas:

- i. Behavioural model for Industrial Safety [Research Team: Prof. P S Paul & Prof. J. Maiti, (Ph.D. Supervisor), IIT Kharagpur]
- ii. Socio-technical Model for Industrial Safety (Research Team: Prof. P S Paul & Prof. J. Maiti, Ph.D. Supervisor IIT Kharagpur)
- iii. Accident Path Model based on the non-compliance of Mines Act, Rules, Regulations and By-laws [Research Team: Prof. P S Paul & Dr. Aweek Mangal, a former PhD Scholar]
- iv. Risk Perception Model [Research Team: Prof. P S Paul & Dr. Falguni Sarkar, a former PhD Scholar]
- v. Accident Investigation Methodologies based on Root Cause Analysis (RCA) [Research Team: Prof. R. M. Bhattacharjee (Supervisor), Prof. P. S. Paul (Co-supervisor) and Dr. Ashish Kr. Dash (former PhD Scholar)]

This methodology has been accepted and notified by MoC, GOI (Order No. I/29444/2022 dt. May 10, 2022) to follow all coal companies to carry out Accident Investigation [<https://coal.gov.in/sites/default/files/2022-05/12-05-2022sfty.pdf>]. Series of Executive Development Programmes (EDP) are being organized Co-coordinator to impart training on “Accident Investigation Methodologies based on Root Cause Analysis (RCA)” to the Executives of different coal companies such as CIL (05 EDP), Adani Natural resources (01 EDP, and NLC India Ltd. (01 EDP) as well as officers of

DGMS (02 EDP).

3. Determination of Aerobic Energy Reserve Left after Working Shift and its Influence on Work Fatigue of Different Categories of Mine Workers

[Research Team: **Prof. P S Paul (PI)**, Prof. R. M. Bhattacharjee (Co-PI and Sakinala Vikram (Senior Research Scholar]

The outcome of this innovative research will help to develop the standard/guidelines of the provision as laid down in the circular published by DGMS regarding the ergonomical study to be carried out in mines based on the recommendation on several safety conferences.

PRODUCTS DEVELOPED BASED ON THE RESEARCH DONE IN THE AREA OF “OCCUPATIONAL HEALTH, SAFETY AND ERGONOMICS”

Development of a Wireless Real-Time IoT Based Gas Monitoring and Communication System using for the Safety of Underground Coal Mine Workers

NEW COURSES THAT CAN BE DEVELOPED BASED ON THE EXPERTISE DEVELOPED

Based on my expertise developed in the area of Mining Safety Engineering through guiding several PhD scholars and publishing more than 75 research articles in reputed journals and conferences, **I am confident to introduce new M. Tech Course in “Mine Safety Engineering and Analytics” as Coordinator.**

FUTURE PLAN OF WORK

- Interactive Classroom room teaching (assignment, flipped class room, team based learning) backed with case studies and best practices of the subjects to be offered to me.
- Bring externally funded project in the area of Mine Safety, Health, and Ergonomics.
- Strengthening the Occupational Health, Safety and Ergonomics Laboratory for more Interdisciplinary Teaching and Research.
- Guiding more full-time Ph.D. students in core mining and also in interdisciplinary areas.
- Publishing research papers in Q1/Q2 Journals with research scholars.
- Continuing Executive Development Programme to train practicing mining engineers in the area of Mine Safety, Health, and Ergonomics
- Starting New course M.Tech (Mine Safety Engineering and Analytics) if Institute permits.
- Building Industry-Institute Interaction in the area of Occupational Health, Safety and Ergonomics.

PUBLICATIONS:

TOTAL Nos. of Research Paper Published: 85 [24 WoS SCI/SCIE/SSCI JCR Q1/Q2/Q3/Q4 Journals]



Signature of the Candidate