

## Prof. Dheeraj Kumar

- Dy. Director, Indian Institute of Technology (ISM) Dhanbad
- Project Director, Mining Technology Innovation Hub, DST, Govt. of India
- Director, TEXMiN Foundation [A section 8 Company of DST, GoI]
- Director, ACIC IIT (ISM) Dhanbad [A section 8 Company of IIT (ISM) & NITI Aayog]



- 21 years' experience in Academic, Research & Consultancy, and Administration
- Founded the Section 8 company on Mining Technology Innovations, TEXMiN Foundation for developing technologies, innovation & start up ecosystems in Mining and Earth Science domains with substantial funding from Govt.of India (Rs. 11000 Lakh under National Mission on Cyber Physical Systems) and industries.
- 15 start-ups' companies in Mining Technology domain are incubated in TEXMiN with substantial financial supports. Most of the founders are from top notch institutions including IITs.
- A group of 25+ IIT Alumni are presently working in TEXMiN Technology Development, Innovation & Entrepreneurship activities under my leadership.
- 38 projects of Technology Development are operated in TEXMiN Foundation under my Guidance out of which 10 technologies are commercialized and being used in coal and metal mines.
- Founded the section 8 company for Community Innovation and the livelihood of local society, ACIC IIT (ISM) Foundation, with substantial funding from Govt. (NITI Aayog) and other organizations. Currently, 29 start-ups are incubated at ACIC IIT (ISM) Foundation.
- Significant credentials in Mining and Construction industries, with R&D projects (ongoing and completed projects) and CoEs with funding of Rs. 3870.57 Lakh sponsored by CIL, MoM, MOC, DST, DoS, MoWR & MoE.
- Developed and commercialized indigenous mining technologies for safe and productive mines.
- Guided 21 PhD Scholars in the domain of Mine digitization, Automation, Remote Sensing & GIS.
- Published 43 Journal papers in SCI indexed Journals (WoS database)
- Ongoing/Completed 73 Industrial projects worth Rs. 3024 Lakhs on Mine Digitization, Monitoring & Digitalization, including Orientation and Alignment of the longest road tunnel (Chenani – Nasri Road Tunnel) connecting Jammu with Srinagar.
- Organized 43 Professional Development Programmes (PDP) of one week to 14 weeks durations and trained 674 Mining Executives in Mine Digitization, Monitoring & Digitalization.
- Started M. Tech Geomatics program with an emphasis on applications of LIDAR, AI-based Image Processing, Drone, and Remote Sensing (Optical & Microwave).
- Coordinator and member at various committees constituted by the Govt. and Industry, namely, Coordinator, Satellite-Based IIRS Outreach Programmes on GIS, GPS & Remote Sensing, IIRS; Member of GISAcademia Council of India; Member of National Geodetic and Geospatial Consortium (NGGC), DST, Govt. of India, Coordinator, RESPOND program of SAC, ISRO, Jharkhand Cluster, etc.
- Operationalizing International Relations and Alumni Cell, Centre for Innovation, Incubation, and Entrepreneurship, Centre for Societal Mission, and Media and Branding Cell.

## 1. Leadership

Position Held	Organization/Institute	Time Period
<b>Dy. Director</b>	Indian Institute of Technology (Indian School of Mines), Dhanbad	29.04.22- till date
Assisting Director in Academic and administrative work and in maintaining liaison with other institutions of higher learning and research, industrial undertakings, etc. Guiding innovation & entrepreneurship, international relations & alumni affairs, developing infrastructure and facilities, etc.		

<b>Dean (Innovation, Incubation, and Entrepreneurship)</b>	Indian Institute of Technology (Indian School of Mines), Dhanbad	19.06.2021 – 28.04.22
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### Major Achievements:

- **Incubated more than 50 start-ups in the areas of community innovations and mining technologies.**
- **Technology Innovation in Exploration & Mining Foundation (TEXMiN)**, a section 8 company under the National Mission on Interdisciplinary Cyber-Physical Systems (NM-ICPS), Govt. of India at the Indian Institute of Technology (Indian School of Mines), Dhanbad with the financial support of Rs. 110 Crores
- **Atal Community Innovation Centre (ACIC) IIT (ISM) Foundation**, a section 8 company under the Atal Innovation Mission (AIM), NITI Aayog with the financial support of Rs. 5.00 Crores
- **SANDVIK Mine Automation Learning Centre (SMAC)**, a mine automation center established by SANDVIK at IIT (ISM) Dhanbad with hardware and software for capacity building in digital mining technologies.
- **Dassault Mining Technology Centre, a CoE established by Dassault Systems with hardware and software** (45 nodes, perpetual professional licenses of about Rs. 230 Crores) for 3D modeling, AR/VR training, Mine Planning, 3D rendering technologies for creating a realistic representation of mines for training, visualization, and remote operations purposes, design and simulation of mechanical, electromechanical, mechatronics, and robotic systems
- **Coal India Innovation and Incubation Centre (CII Centre)**, to nurture early innovators to ideate in the mining technology and promote economically viable start-ups through pre-incubation and incubation with the financial support of Rs. 10.00 Crores
- **ESRI-TEXMiN Geospatial Centre, a COE being established by ESRI** in the area of Remote Sensing for mining & exploration with a total investment of about Rs. 200 Crores (cost as per GeM price (Software and training modules)
- **Sandvik sponsored scholarships:** Rs. 1.08 Cores for five years during 2021 -26.
- **Regional Centre of Geodesy**, a center sponsored by DST, GoI (rs. 1.44 Crores) for promoting research and education in Geodesy & GNSS

Position Held	Organization/Institute	Time Period
<b>Dean (International Relations &amp; Alumni Affairs)</b>	Indian Institute of Technology (Indian School of Mines), Dhanbad	21.05.2018- 18.06.2021

### Major achievements:

- **Setting up innovation, incubation and entrepreneurship ecosystem**
- **Strengthening and linking the chapters globally:** 12 Indian and 4 overseas
- **Contributions from Alumni:** Rs. 12.76 Crores (11 Smart Classroom, 2 studios with NPTEL recording facilities, Tinkering and innovation Centre, IEF, etc.)
- **Alumni Database Creation:** 20000+ update records of Alumni (**Alumni Portal:** <http://alumni.iitism.ac.in>)
- **eStore collectibles merchandise portal:** <https://iitism.campusmall.in>
- **Establishment of Media and Branding Cell (MBC):** Quarterly Newsletters, LinkedIn, Facebook, Twitter handles, etc.
- **MSME Approved HI:** IIT (ISM) became a business incubator for MSME

- **Five Star rating to CIIE:** Best Incubation Centre in Eastern Region
- **Naresh Vashist Centre for Tinkering & Innovation**, with the generous support of Rs. 8.20 Crores
- **Member of the prestigious Heritage Network** (19 leading Institutions).
- **IR portal with the online application process** (incoming and outgoing mobilities)
- **Significant increase in Duo India Fellowships, SHASTRI Mobility Programme, GIAN Courses**
- **Mitacs Globalink Research Internship:** 52 students (2018 and 19)
- **Collaborative International R&D Projects: 9**
- **MoUs with Foreign Universities: 22**
- **Foreign Mobilities:** 12(Faculty), 50+ (Students)
- **Foreign Admissions:** Increased foreign mobility through ICCR, ASEAN, Govt. of Ethiopia, MHE Afghanistan, OVL Mozambique, and Sudan
- **Significant increase in Alumni sponsored Scholarships** (52), Academic Excellence Awards (8), Best teacher Award, and Best Innovator Award
- **KPMG World Ideation Challenge 2020 & Adobe Analytics Challenge 2020: Won by students of IIT (ISM)**
- **State and National level School Innovation Challenge/BeingArtifex Skillathon - 2021**
- Skill Development Programme: 500+ students of local villages
- **Free Coaching for Classes 9-12 and IIT-JEE**
- **Women Empowerment Programmes**

Position Held	Organization/Institute	Time Period
<b>Assoc. Dean (Infrastructure)</b>	Indian Institute of Technology (Indian School of Mines), Dhanbad	09-01-2018 – 20.05.2018
<b>Major achievements:</b>		
<ul style="list-style-type: none"> <li>• Operationalization of Central Library Building and 1000 capacity girl's hostel.</li> <li>• Acquisition of 226.98 acres of land for the second campus.</li> <li>• Plugging the unauthorized entry points to campus already existed in the periphery of the Institute.</li> <li>• Dedicated power supply from DVC (Hotline)</li> </ul>		

Other key Positions Held	Organization/Institute	Time Period
Convenor (Improvement Group) (A team of 25 persons comprising of Deans, HoDs, HoCs)	Indian Institute of Technology (Indian School of Mines), Dhanbad	20-10-2011 – 19.10.2017
<ul style="list-style-type: none"> <li>• Formulating innovative strategies for improvement of existing systems and procedures to improve the quality of the deliverable and the pace of delivery and to usher in the spirit of innovation into the system.</li> <li>• Suggesting possible improvements in the system and preparation of a roadmap for the implementation of new ideas as and when generated</li> <li>• Contributing significantly towards further growth of the Institute to make it at par with the leading institutes of the world (CRF, SAC, online Feedback Systems, MIS, CC, etc.)</li> </ul>		
Co-Coordinator/Coordinator, TEQIP -II & III	Indian Institute of Technology (Indian School of Mines), Dhanbad	01-09-2011-19.07.2018
Chairman, Admissions	IBAT, KIIT University, Bhubaneswar	01.07.2004 – 09.08.2005
Head, Education & IT	Indian Institute for Production Management, L&T Kansbahal	01.04.2003- 30.06.2004

## 2. Academic Experience at IIT (ISM) Dhanbad (Since August 10, 2005)

- Geospatial Technology, Mine Surveying, Mine Planning & Design, IT & Automation in Mining courses with vast field experience in digital land documentation, subsidence, alignment and orientation, earthwork calculations, etc.
- Re-oriented M. Tech Geomatics program as an IDP with emphasis on applications of LIDAR, AI-based Image Processing, Drone, and Remote Sensing (Optical & Microwave).
- Developed capabilities in Geospatial Technologies in Mining and allied areas with support from ISRO (IIRS & NRSC), and IITs (IITK, IITR).
- Enriched Mine Surveying & Geomatics laboratory with modern surveying instruments, software, and techniques with funding support from FIST, TEQIP, and other sponsored projects.
- Taught UG and PG courses [Mine Surveying, Geospatial Technologies for Natural Resources, Computer-Aided Mine Planning & design]
- Rated with a good feedback score of 179-183 (out of 200) in UG classes (Class strength 75-85) .
- Organized Satellite-based Outreach Programmes on Geodesy, GNSS, and Remote Sensing jointly with IIRS Dehradun & IIT (ISM) Dhanbad and trained more than 300 students with certificates from IIRS.
- Organized certificate program for our UG, PG, and Ph.D. students on Creating Geospatial and Location Intelligence Application and Handling of Big Data.

## 3. Research & Development and Innovation

- **Publications:** Published 3 books, 66 papers (SCI & Scopus)
- **Ph.D. Guided:** 21
- **Patent:** 0244NF2016 (A method for efficient design of roof bolt-based breaker line support in mechanized depillaring).
- **R&D projects/CoEs:** Funding support of Rs. 3870.5 Crores sponsored by CIL, MoM, MOC, DST, DoS, MoWR & MoE.
- **Project Advisor,** Coal India innovation & incubation Centre
- **Project Advisor,** Regional Centre of Geodesy, sponsored by DST

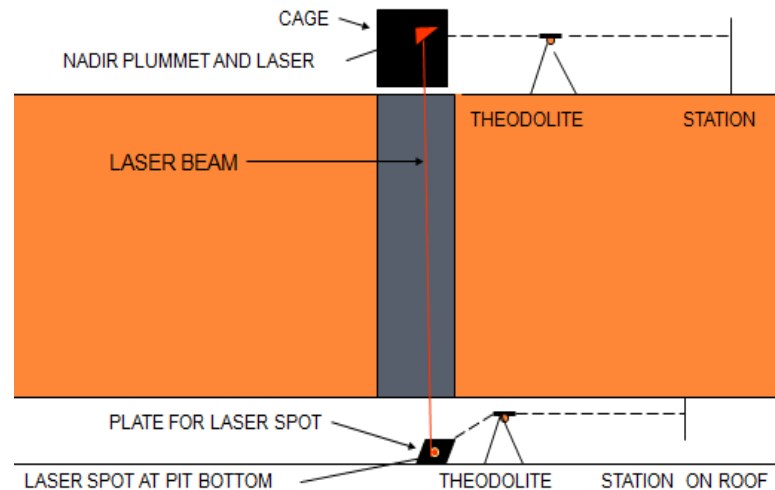
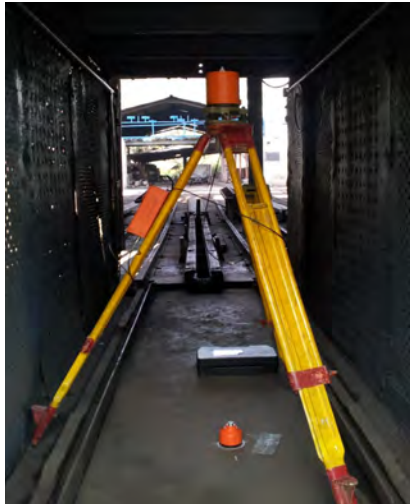
### Product /Process Development

- Designed, developed, and commercialized a lightweight, medium duty 2X200t capacity SAGES with remote radio controlled and digital display system (**Commercialized**)

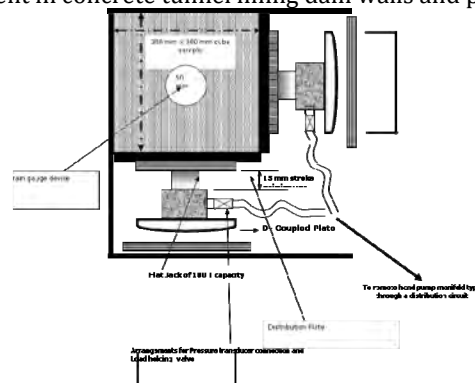


(An IIT (ISM) breakthrough in the mission of Make in India – Design and Development of Automated Roof Support System “SAGES” for SAFE, PRODUCTIVE, and ECONOMIC extraction of locked coals from underground mines. SAGES is unique in terms of its patented design of base to slide inside the undercarriage and hence cheaper, light in weight, and compact.)

- Development of a methodology for laser-guided orientation and correlation surveys in mines (**Methodology presently being used in mines**)



- Development of a setup for stress measurement in concrete tunnel lining dam walls and pillars (**POC**)



- Online Spectral Library Archival and Analysis System (with IIRS)
- Web-based virtual laboratory for geospatial data processing analysis (with IIRS)

#### 4. National/International Credentials and Awards

- Project Director, Mining Technology Innovation Hub, set up by Govt. of India
- Member, Central Empowered Committee (CEC) & Ore Assessment Committee (Constituted by Govt. of India)
- Advisor, Society for Mining, Metallurgy, and Exploration (SME-India), USA
- Member, PMMC, National Centre in Geodesy
- Member, National Geodetic and Geospatial Consortium (NGGC)
- Member, GISAcademia Council of India
- SBI Best Researcher award (five consecutive terms, 2012-2017)
- "Hindustan Zinc Limited Award" by the Institution of Engineers (INDIA)
- "Meritorious Scholar" awards at IIT Kharagpur (three consecutive terms, 2001-2004)

#### 5. Industry Consulting

- Completed/ongoing 73 Industrial projects worth Rs. 3024 Lakhs in the area of Mine Surveying, Remote Sensing & GIS, Drilling & Blasting, IT & automation.

##### Some of the key outcomes

- Orientation and Alignment Survey at Chenani – Nasri Road Tunnel connecting Jammu with Srinagar





- Assessment and Monitoring of Land Surface Subsidence due to Stopping in Hard Rock Metal Mining
- Geofencing & georeferencing of the lease pillars and preparation of digital georeferenced map & generation of Geo-referenced shapefiles and 3D modeling of mine
- 3D Numerical Simulation of Subsidence due to Underground Mining & CBM
- Scientific study for Earthwork estimation in Coal Mine Projects using an integrated approach (3D LIDAR and Geodetic Techniques)

## 6. Outreach Programmes

- Organized 43 Professional Development Programmes (PDP) of one week to 14 weeks durations.
- Trained 674 Mining Executives in the areas of Advance Mine Surveying, Advances in Underground Mining, Drilling & Blasting, Mine Planning, Design, etc.
- Organized Satellite-based Outreach Programmes on Geodesy, GNSS, and Remote Sensing jointly with IIRS Dehradun & IIT (ISM) Dhanbad and trained more than 300 students with certificates from IIRS.
- Organized certificate program for our UG, PG, and Ph.D. students on Creating Geospatial and Location Intelligence Application and Handling of Big Data.
- Organized both international and National Conferences at IIT (ISM) and outside IIT (ISM) as Convenor and Co-Convenor (9<sup>th</sup> IMVC-2007, UMMSP -2006, ICMS – 2006, 2012)
- Organized institute events (Basant, Conchetto, Convocations, etc. as a convenor)

**ON-GOING**

- 1. Project title: Establishment of Regional Centre of Geodesy**  
**Objective:** R&D and capacity building in Geodesy & GNSS  
**Project value:** Rs. 144 lakhs  
**Sponsoring Agency:** Department of Science & Technology, GoI  
**Project Advisor :** Prof. Dheeraj Kumar
- 2. Project title: Development of Virtual Reality Mine Simulator for improving safety and productivity in underground coal mines**  
**Objective:** VRMS development for Opencast and underground coal mines with JKTech-SMI, University of Queensland  
**Project value:** Rs. 1320 lakhs  
**Sponsoring Agency:** Coal India R&D Board  
**Coordinators:** Prof. V.M.S.R. Murthy and Prof. Dheeraj Kumar
- 3. Project title: Development and Field Trial of 500 T Capacity SAGES-III for Use with Continuous Miners (Phase- III)**  
**Objective:** Design and Development of SAGES Support System (500T) for use with Continuous Miners in a depillaring panel at SCCL  
**Project value:** Rs. 396.69 lakhs  
**Sponsoring Agency:** Ministry of Coal, Govt. of India  
**Coordinators:** Prof. Dheeraj Kumar & Prof. U. K. Singh
- 4. Project title: “Scientific study for preparation of Computer Aided 3-D Model of Ground Level of Tasra Open Cast Project, SAIL Collieries Division**  
**Objective:** Preparation of Digital Model of Tasra Mines, SAIL  
**Project value:** Rs. 11.54 lakhs  
**Sponsoring Agency:** SAIL RMD  
**Coordinators:** Prof. Dheeraj Kumar
- 5. Project title: “Slope Instability Severity Assessment (SIS) at Coalfield Level using Integration of Innovative Spaceborne InSAR and Relevant Data for Enhanced Slope Failure Predictions.**  
**Objective:** Preparation of slope instability severity map (SISM) based on the obtained validated results of the integrated DInSAR and PSI approach and other related factors on coalfield level to support decision-making and enhance the predictive ability for catastrophic slope failure  
**Project value:** Rs. 56.94 lakhs  
**Sponsoring Agency:** SERC, DST  
**Coordinators:** Prof. S. Alam & Prof. Dheeraj Kumar

**6. Project title: "Detection and Monitoring of Longwall Subsidence of Moonidih Colliery, BCCL using Spaceborne SAR Interferometry (InSAR) Techniques (BCCL/2023-24/1010/MNE)**

**Objective:** Developing a framework for Detection and Monitoring of Longwall mining induced surface subsidence at Moonidih Project, BCCL using InSAR Techniques.

**Project value:** Rs. 39.89 lakhs

**Sponsoring Agency:** BCCL, Coal India Ltd.

**Coordinators:** Prof. S. Alam & Prof. Dheeraj Kumar



## COMPLETED

- **Project title:** Assessment and prediction of land surface deformation due to underground metal mining in Northern Aravali Range of Hills using Microwave Remote Sensing data sets and ground-based observations  
**Objective:** Detection of land surface deformation due to underground metal mining, using satellite microwave remote sensing data sets. Assessment of land surface deformation in mining area using Differential Interferometric Synthetic Aperture Radar (D-InSAR) technique  
**Project value:** Rs. 45 lakhs  
**Sponsoring Agency:** Ministry of Mines, GOI  
**Coordinators:** Prof. Dheeraj Kumar & Md. S. Alam  
**Findings:** A new method for subsidence monitoring has been developed using Modified PSInSAR Technology
- **Project title:** Thermal Anomaly Detection and Monitoring of Coal Fire in Gondwana Coalfields and Coal Fire Induced Land Subsidence using Remote Sensing and Ground Based Techniques  
**Objective:** Modelling of 'pixel-integrated temperature' for medium & coarse spatial resolution TIR data (TM/ASTER & MODIS/AVHRR) by ground-based TIR imaging for thresholding thermal anomaly associated with coal fire and Coal fire induced regional land subsidence monitoring in the Gondwana Coalfields  
**Project value:** Rs. 19.39 lakhs **Sponsoring Agency:** ISRO, IIRS  
**Coordinators:** Prof. Dheeraj Kumar  
**Findings:** An algorithm has been developed for the detection of coal fire and coal fire-induced subsidence using Remote Techniques
- **Project title:** Techno-economic Evaluation and Performance Behaviour of Self Advancing (mobile) Goaf Edge Supports (SAGES) (Phase – II)  
**Objective:** Modifications and Refurbishment of 6 nos. of SAGESs  
Study of performance behavior of modified SAGESs in an underground coal mine of SCCL and its influence on ground behavior  
Study of economic feasibility of modified SAGESs over conventional techniques of support systems at goaf edges  
**Project value:** Rs. 73.27 lakhs  
**Sponsoring Agency:** MOC, GOI  
**Coordinators:** Prof. U. K. Singh & Prof. Dheeraj Kumar  
**Findings:** A medium duty 200T Self – advancing Goaf Edge Support Systems (SAGES) has been designed, developed, and commercialized for depillaring operations in underground coal mines.
- **Project title: Development of Self Advancing (Mobile) Goaf Edge Supports (SAGES) for Depillaring Operations in Underground Coal Mines**  
**Objective:** Design and develop Self Advancing Goaf Edge Support (SAGES) of Medium Duty: 2x200t Load Capacity for depillaring operations in underground coal mines  
**Project value:** Rs. 197.75 lakhs  
**Sponsoring Agency:** Ministry of Coal, GOI  
**Project Coordinators:** Prof. U. K. Singh & Prof. Dheeraj Kumar  
**Findings:** Stress analysis for structural design and material to be used for fabrication of the SAGES using Finite Element Modeling (FEM) is done. JBEPL has started the fabrication of one set of the SAGES based on the outcome of the FEM analysis of the modeled structure

- Project title: Prediction of the Stability of Spread Footing Foundation on Weak Floor Jointed and Layered Rock Mass Using Multi-Model Finite Element Analysis and Artificial Neural Network Technique**

**Objective:** Stability analyses of jointed rock foundations by Finite Element Modeling (FEM) using the multiple yield models.

**Project value:** Rs. 22.88 lakhs

**Sponsoring Agency:** SERC, Dept. of Science & Technology, GOI

**Project Coordinators:** Prof. Dheeraj Kumar & Prof. U. K. Singh

**Findings:** Finite Element Modeling (FEM) of simulated floor strata incorporating such variations as required for fulfilling the objectives of the projects, has been done. A neural network has also been developed to predict the ultimate bearing strength of the weak floor jointed and layered rock mass
- Project Title: Development of a setup for stress measurement in concrete tunnel lining dam walls and pillars**

**Project value:** Rs.15.22 Lakhs

**Sponsoring agency:** Ministry of Water Resources, R & D Division, New Delhi

**Project Coordinators:** Prof. U. K. Singh and Prof. Dheeraj Kumar

**Objective:** Development of a strain gauge-based device for mounting on the wall for measurement of absolute stress in concrete tunnel lining, dam, and pillars

**Findings:** A setup for stress measurement in concrete tunnel lining dam walls and pillars comprising of development of SRB (Strain Rosette Block) and other sub-components have been developed and a trial has been undertaken in the laboratory.
- Project Title: Development of a computer-based Mine Information System (MIS) to provide up to date database for an opencast mine**

**Project value:** Rs.16.00 lakhs

**Sponsoring agency:** MHRD, Govt. of India

**Project Coordinators:** Prof. P. P. Bahuguna and Dr. Dheeraj Kumar (Co-PI)

**Objective:** Development of an information system using GIS for a mine incorporating a base map of mine, contours, building, roads, etc.

**Findings:** A mine information system based on GIS was developed. All survey data was incorporated in the base map and other information pertaining to Geology, mine benches, haulage roads, sumps, mine faces, reduced level, positions of various machinery, etc. were also put as various layers and integrated with MIS.
- Project title: To Strengthen Teaching Facilities in Geomatics & Underground Space Technology (FIST)**

**Objective:** Development of Teaching & Lab facility, M. Tech (Geomatics) & Underground Space Technology

**Project value:** Rs. 257 lakhs

**Sponsoring Agency:** DST, SERC, GOI

**Project Coordinators:** Prof. Dheeraj Kumar & Prof. V.M.S.R. Murthy
- Project title: TEQIP - II**

**Objective:** Scaling-up Post Graduate Education and demand-driven R&D&I

**Project value:** Rs. 1250 lakhs

**Sponsoring Agency:** MHRD, GOI

**Coordinators:** Prof. A. K. Mukhopadhyay & Prof. Dheeraj Kumar

- **Project title: TEQIP - III**

**Objective:** Mentoring under a twinning arrangement for self-growth and growth of mentee institution

**Project value:** Rs. 750 lakhs

**Sponsoring Agency:** MHRD, GOI

**Coordinator:** Prof. Dheeraj Kumar

**Status:** Completed

### Annexure - III: Consultancy Projects

#### ON-GOING

S. No.	Title of the Project & Consultancy Number	Client
1.	“Scientific Study for OGL and different survey work of different survey works of Kerandari Coal Mining Project (CONS/7065/ 2022-23) <b>Rs. 435.35L (22-23)</b>	NTPC
2.	Subsidence Study of Khetri Copper Mine and Kolihan Copper Mine, Hindustan Copper Limited (HCL), Khetri Copper Complex (KCC), Rajasthan (CONS/7001/ 2021-22) <b>Rs. 97.94L (22-23)</b>	HCL Khetri
3.	Scientific Study for 3D advanced different survey work of ChattiBariatu Coal Mining Project (CONS/6091/ 2021-22) <b>Rs. 72.36L (21-22)</b>	NTPC

#### Completed

S.No.	Title of the Project & Consultancy Number	Client
1.	“Geofencing & georeferencing of the lease pillars and preparation of digital georeferenced map & generation of Geo-referenced shapefiles and 3D modeling of iron ore stacks within the lease area along the western part of the lease boundary at Vijaya II Mines (CONS/6097/ 2021-22)	Tata Steel Long Product Limited
2.	3-D subsidence prediction model for Kenda, Rakha and Surda mines of HCL (CONS/6055/2021-22)	HCL ICC
3.	Geo-referencing of Cadastral Map (Showing Mine Lease Boundary) of Ramnagore Indikata Block of Ramnagore Colliery 2.25L SAIL(7)/2022-2023/889/ME	SAIL
4.	Scientific Study for Annual Reconciliation survey for the Earthwork Estimation at PBCMP, NTPC (CONS/6017/2020-21)	NTPC
5.	Scientific study for the preparation of Computer-Aided 3-D Model of Ground Level of Tasra Open Cast Project, SAIL- Collieries Division (IITRD/21-22/18	SAIL
6.	Geo- Identification & demarcation of the area under Malanjkhanda Copper Mining Lease by cadastral survey and preparation of digital geo-referenced map & generation of Geo-referenced shape files by DGPS Survey of that area	HCL
7.	Correlation Survey at newly sunk return shaft at Moonidih XV seam (CONS/5042/2019-20)	INDU
8.	Preparation of High-Resolution Satellite Map obtained from the fusion of CARTOSAT-2 & LISS-IV datasets on the scale of Cadastral Map of Iron Ore Mines of SAIL covering the mining lease and an area of two kilometers from the lease boundary	SAIL, RMD
9.	Geo-referenced Boundary coordinates for Sand Mining Leases of Chasnalla and Jitpur, SAIL	SAIL, RMD
10.	Geo-referencing of Mine Plans of all the mines of Jharia Division of Tata Steel in WGS 84 Coordinate system and capturing of Geographic Coordinates of Lease Boundaries	Tata Steel Ltd.

11.	Preparation of Technical Feasibility Report for II phase Expansion Plan of Khetri Copper Mine (CONS/3497/2017-18)	Hindustan Copper Limited
12.	Geo-referenced cadastral plan showing the lease hold area, forest area and forest land diversion area within the lease of Rajbar E&D Coal Mine, TVNL into WGS coordinates system (CONS/3555/17-18)	Tenughat Vidyut Nigam Limited
13.	Identification & demarcation of area under Rakha mining lease (Total 785.091 hectares) by cadastral survey and preparation of digital geo-referenced map & generation of Geo-referenced shape files by DGPS Survey of that area (CONS/3916/18-19)	Hindustan Copper Limited
14.	Identification & demarcation of area under Kendadih Mining Lease (Total 1139.6 hectares) by cadastral survey and preparation of digital geo-referenced map & generation of Geo-referenced shape files by DGPS Survey of that area	Hindustan Copper Limited
15.	Correlation Survey of Digwadhi Colliery (CONS/2894/2016-17)	Tata Steel Ltd.
16.	DGPS Survey and preparation of Geo-referenced cadastral Map of Tummalapalle Uranium Mine (CONS/3177/2016-17)	Uranium Corporation India Ltd.
17.	Geo-referencing of cadastral map of Chasnala, Tasra and Jitpur Coal Block of SAIL ISP into WGS 84 coordinates (CONS/3234/2016-17)	SAIL, ISP
18.	Geo-referenced cadastral map of Sitanala Coal Block of Chasnalla Colliery, SAIL ISP into WGS 84 coordinates (CONS/3237/2016-17)	SAIL, ISP
19.	Determination of overall Stripping Ratio of Parbatpur Quarry and Geo-referencing of Cadastral Map of Parbatpur Central Coal Mine (CONS/3258/16-17)	SAIL, ISP
20.	Identification & demarcation of the area under Surda mining lease (Total 388.68 hectares) by cadastral survey and preparation of digital geo-referenced map & generation of Geo-referenced shape files by DGPS Survey of that area (CONS/3260/2016-17)	Hindustan Copper Ltd.
21.	Determination of Striping ratio of Salanpur 'C' Quarry of Ramnagore Colliery (CONS/3259/2016-17)	SAIL, RMD
22.	DGPS Survey of intermediate pillars (broken area) for geo-referencing of Cadastral Map and diverted area map of Kiriburu-Meghahatuburu Iron Ore Mines of M/s SAIL into WGS-84 co-ordinates and preparation of shapefiles for submission to MoEF& CC (CONS/2894/2016-17)	SAIL, RMD
23.	DGPS Survey of Demarked Lease Boundary Pillars of existing leasehold area, old leasehold area & forest area of Tulsidamar Dolomite Mines, SAIL (CONS/3433/2016-17)	SAIL, RMD
24.	Geo-referencing of cadastral map of Ghagra, Gorgaon, and Saraiya mining leases of Bhawnathpur Group of Mines, SAIL into WGS 84 coordinates (CONS/3433/2016-17)	SAIL, RMD
25.	DGPS Survey and preparation of Georeferenced cadastral Map of Gogi Uranium Mine of M/s UCIL (CONS/3373/2016-17)	UCIL
26.	Geological investigations to evaluate the reserve of material available in-situ at Khanak Stone Mines Tehsil Tosham, Distt.Bhiwani	HSIDC
27.	Geo-referencing of approved land use and reclamation plan of Begunia UG Coal Mining Project, SAIL into WGS 84 coordinates and preparation of shapefile (3515/17-18)	SAIL, RMD

28.	Identification & demarcation of the area under Sand mining leases of Tata Steel, Jharia Division by DGPS survey and preparation of geo-referenced Cadastral map of the mining leases (CONS/3374/16-17)	Tata Steel Ltd.
29.	DGPS Survey and preparation of Georeferenced cadastral Map of Bihar Iron Ore Mines of M/s Nirmal Kumar Pradeep Kumar (CONS/2847/15-16)	Nirmal Kumar Pradeep Kumar
30.	DGPS Survey and preparation of Georeferenced cadastral Map of Karampada Iron Ore Mines of M/s Singhbhum Mineral Company (CONS/2863/15-16)	Singhbhum Mineral Company
31.	DGPS Survey and preparation of Georeferenced cadastral Map of Ghatkuri Iron Ore Mines of M/s Nirmal Kumar Pradeep Kumar (CONS/2848/15-16)	Nirmal Kumar Pradeep Kumar
32.	DGPS Survey and preparation of Georeferenced cadastral Map of Sosopi Iron Ore Mines of M/s Khushal Arjun Rathor (CONS/2864/15-16)	Khushal Arjun Rathor
33.	DGPS Survey of Amalgamated Demarked Lease Boundary Pillars of Kiriburu and Meghahatuburu Iron Ore Mine, SAIL (CONS/2818/15-16)	Steel Authority of India Ltd.
34.	Certification by ISM, Dhanbad for work done under Mine Closure Plan of Dharmasthal Coal Project of M/s BLA Industries Pvt. Ltd. (CONS/2895/2015-16)	BLA Industries Pvt. Ltd
35.	Subsidence Monitoring at forest area above the underground working within mining lease of UCIL Jaduguda (CONS/3154/2015-16)	Uranium Corporation of India Ltd.
36.	DGPS Survey of Demarked Boundary Pillars of Banam Guttuu Quartzite Mine, Jamshedpur (CONS/2894/2015-16)	Chanduka
37.	DGPS Survey of demarked boundary pillars of lease hold area and the forest area within the existing lease hold area of Jitpur Coal Block of M/s Adani Power Limited (CONS/3029/2015-16)	Adani Power Limited
38.	Certification by ISM, Dhanbad for work done under Mine Closure Plan of Ardhamgram Coal Block of M/s Sova Ispat Ltd., Mejhia, Bankura (CONS/2894/2015-16)	Sova Ispat Ltd
39.	DGPS Survey of Lease Boundary Pillars of Dhobil and Ajitaburu Mining Leases of Manoharpur Iron Ore Mines (MIOM), SAIL (CONS/3225/2016-17)	M/s SAIL, RMD
40.	DGPS Survey of Lease Boundary Pillars of Mclellan Mining Leases of Manoharpur Iron Ore Mines (MIOM), SAIL (CONS/3238/2015-16)	SAIL, RMD
41.	Land Surveying and Contouring within Lease Hold Area of Sitanala Coal Block of Chasnalla Colliery, SAIL ISP (CONS/2448/2013-14)	SAIL ISP
42.	DGPS Survey of Demarked Boundary Pillars Vijay-II, Iron Ore Mine, M/s Usha martin Limited, Barajamda, West Singhbhum	Usha Martin Ltd.
43.	SUBSIDENCE MONITORING AT ESSAR RANIGANJ CBM BLOCK AT DURGAPUR [RG (E) – CBM-2001/1 BLOCK]	Essar Oil Ltd. (E&P Division)
44.	Determination of Striping ratio of Laikdih Quarry of Ramnagore Colliery (CONS/2819/2014-15)	Steel Authority of India Ltd.
45.	DGPS Survey of Demarked Boundary Pillars of sub-block IV/4 & IV/8 of Ushaa Coal Mine of M/s Jayaswal Neco Industries Ltd., Millupara, Raigarh (CONS/2330/2013-14)	Jayaswal Neco Industries Ltd., Raigarh
46.	Subsidence Study of Khetri Copper Mine & Kolihan Copper Mine at Khetri Copper Complex, Rajasthan (CONS/2275/2013-14)	Hindustan Copper Ltd.



47.	Training Need Analysis in Mining Domain for Infosys Mining Team (CONS/2230/2013-14)	INFOSYS, Pune
48.	Land Surveying and Contouring within Lease Hold Area of Sitanala Coal Block of Chasnalla Colliery, SAIL ISP (CONS/2448/2013-14)	SAIL ISP
49.	Gyroscopic Survey for Alignment Survey in the Tunnel using Gyromat 3000 (CONS/2467/2013-14)	Leighton Welspun Pvt Ltd.
50.	Digitization of Lease Hold Boundary of S J Harvi Iron Ore Mine (1708/2011-2012)	S V.S. Lad & Sons, Bangalore
51.	Conversion of Mine Plans of Chasnalla & Tasra Colliery, IISCO, SAIL from 1:12000/1:1200 scale to 1:4000/ 1:5000 scale (CONS/1908/12-13)	SAIL- ISP
52.	Land Subsidence Study at Essar Raniganj CBM Block At Durgapur [Rg (E) – CBM-2001/1 Block] (CONS/2015/2012-13)	Essar Oil Ltd. (E&P Division)
53.	Check Survey of Milupara and Kondekal Underground Mines Of M/S Monnet Ispat & Energy Ltd., (MEIL) Raigarh (CONS/2086/2012-13)	Monnet Ispat & Energy Ltd.
54.	Training Need Analysis in Mining Domain for Infosys Mining Team (CONS/2230/2013-14)	INFOSYS, Pune
55.	DGPS Survey of Demarked Boundary Pillars of Tubed Coal Block of TCML (CONS/2209/2013-14)	Tubed Coal Mines Ltd., Latehar
56.	Check Survey at Milupara and Kondekal UG mines of M/s MIEL Ltd. (Cons/1441/11-12)	Monnet Ispat and Energy Ltd.
57.	Shaft Correlation at Moonidih Colliery, BCCL Dhanbad (Cons/1614/11-12)	Indu Projects Ltd.
58.	Surface Survey of Bhutgoria Colliery and Preparation of Surface Plan (Cons/1130/2010-11)	Tata Steel Ltd.
59.	Scientific study for fixing controlled blasting parameters at Khoodia Colliery, Mugma Area (Cons/0775/09-10)	Eastern Coalfields Ltd.
60.	Scientific study for fixing blasting parameters for the OC Patch at Nichitpur Colliery, Sizua Area (Cons/0720/08-09)	Bharat Coking Coal Ltd.
61.	Scientific study for fixing blasting parameters for the OC Patch at Bhowra (N) Colliery, (Cons/0633/08-09, October)	Bharat Coking Coal Ltd.
62.	Checking old Mine Plans of ISP – SAIL Collieries regarding maintenance as per The statue, Chasnalla, (Cons/0722/08-09, September)	IISCO, SAIL
63.	Check survey to locate the position of underground workings with respect to the position of the river on the surface at Millipura Underground coal Mines of MIEL (Monet Ispat and Energy Ltd.), (Cons/0713/08-09, November)	Monet Ispat and Energy Ltd.
64.	Intermediate RL measurement in Chandore patch (Hired HEMM) of AKWM, OCP, Katras Area (Cons/0268/2007)	BCCL
65.	Superimposing National Grid on Old Mine plans by connecting them to National Grid system for Tasra Opencast Project of IISCO Steel plant, Chasnala (CONS/0280/2007)	SAIL, IISCO
66.	Surface surveying & contouring job for Sitanala Coal Block, SAIL-IISCO Steel Plant, Chasnala Colliery (CONS/0328/2007).	SAIL, IISCO
67.	Fixing GPS Coordinates for identified locations at Gomia, ICI Plant (CONS/0435/2007)	Orica Mining Services, IEL
68.	Check survey at in underground working of Ramnagore colliery (CONS/0254/2007)	SAIL, IISCO
69.	Ground vibration and air overpressure study at Ostapal Chromite mines during deep hole blasting & suggestions to control (Cons/0124/06)	FACOR, Bhadrak

70.	Final RL measurement of Murulidih OCP (Patch II) of WJ Area, BCCL (Cons/0125/06)	BCCL
71.	Final RL survey in East Side Quarry of the specified area as marked on the Plan at Chasnala Colliery (Cons/0134/06)	IISCO

## Executive Development Programmes Conducted

S.No.	Course No. and Duration	Title
1.	EDP/7017/22-23 20.06.22 – 29.07.22	Modern Mine Surveying Techniques
2.	EDP/5051/19-20 05.08.19 – 31.08.19	Modern Mine Surveying Techniques
3.	EDP/5023/19-20 15.07.19 – 25.07.19	Informal learning opportunities for the officials of the Ministry of Mines and Petroleum, Govt. of Afghanistan
4.	EDP/5090/2019-20 11.01.20 & 17.01.20	Developing Indo-Australian Collaboration for Sustainable Mining in India
5.	EDP/009/18-19 23.07.18 – 31.08.18	6 weeks course on Advances in Mine Surveying
6.	EDP/4087/18-19 14.01.19 – 25.01.19	Informal learning opportunities for the officials of the Ministry of Mines and Petroleum, Govt. of Afghanistan
7.	CONS/3496/2017-18 03.07.17-12.08.17	6 weeks course on Advances in Mine Surveying
8.	CONS/---/2017-18 22.01.18-26.01.18	Application of Modern Surveying Techniques for DMG, Govt. of Jharkhand
9.	CONS/3224/2016-17 26.04.16-28.04.16	3-days Professional Development Programme on Application of Modern Tools and Techniques for Mine Surveying
10.	CONS/3108/2015-16 14.12.15-08.01.16	4 weeks course on “Practical Mine Surveying” for Mine Surveyors and Apprentice in Mine Surveying
11.	CONS/3039/2015-16 26.10.15-04.12.15	6 weeks course on Advances in Mine Surveying
12.	CONS/2723/2014-15 27.10.14-05.12.14	6 weeks course on Advances in Mine Surveying
13.	CONS/2795/14-15 21.01.15 15.02.15	4 - Weeks of Advanced Training on Mining Operations for HZL Young Underground Mining Engineers
14.	CONS/2341/2012-13 23.09.13-29.11.13	6 weeks course on Advances in Mine Surveying
15.	CONS/1780/2012-13 07.05.12-16.06.12	6 weeks course on Advances in Mine Surveying
16.	CONS/1843/2012-13 09.07.12-04.08.12	4 weeks Advanced Training on Mining Operations for HZL Young Underground Mining Engineers
17.	CONS/1910/2012-13 17.09. – 13.10.12	4 weeks Advanced Training on Mining Operations for HZL Young Underground Mining Engineers
18.	CONS/1985/2012-13 17.09. – 13.10.12	4 weeks course on “Practical Mine Surveying” for Mine Surveyors and Apprentice in Mine Surveying
19.	CONS/2106 / 12-13 18.03.13-21.03.13	4- day Professional development programme on Importance of Survey & Investigation in Hydropower Projects (For NHPC Executives)
20.	CONS/2168/2013-14 26.05.13-09.06.13	Two-week Training Programme on Underground Metal Mining Technology” for Officials of Ministry of Mines, Govt. of Afghanistan

21.	CONS/1358/10-11 11.04.11 – 15.04.11	Advancements in Blasting Technology for Improved Productivity in Coal Mines
22.	CONS/1389/2011-12 02.05.11-10.06.11	6 weeks course on Advances in Mine Surveying
23.	CONS/1435/2011-12 04.07.11-30.07.11	4 weeks course on Mine Surveying for an apprentice in Mining for HZL
24.	CONS/1439/2011-12 27.06.11-02.07.11	One week course on GPS, Total Station and Preparation of Mine Plans
25.	CONS/ 1607 /2011-12 01.08.11 – 05.08.11	One week course on Digitization of Mine Plans
26.	CONS/1608/2011-12 17.08.11 – 21.08.11	One-week course on Digitization of Mine Plans
27.	CONS/ 1609 /2011-12 19.09.11 – 23.09.11	One week course on Digitization of Mine Plans
28.	CONS/1169/2010-11 23.08.10-02.10.10	6 weeks course on Advances in Mine Surveying
29.	CONS/1059/09-10 20.04.10-24.04.10	Best blasting practices for improved productivity in coal mines for TATA Steel
30.	CONS/825/2008-09 22.06.09-26.06.09	Blasting and tunneling technologies for NHPC
31.	CONS/747/2008-09 11.05.09 – 20.06.09	6 weeks course on Advances in Mine Surveying
32.	CONS/0928/09-10 13.11.09 – 02.01.10	6 weeks course on Advances in Mine Surveying
33.	CONS/0950/09-10 07.12.09-09.12.09	Surveying Software, Survey Engineering Environment (Quantity Estimation) for NHPC
34.	CONS/0591/2008 (18-08-08 to 13-09-08)	4 weeks refresher course in Surveying
35.	CONS/0653/2008 (20-10-08 to 29-11-08)	6 weeks course on Advances in Mine Surveying
36.	CONS/736/2008-09 27.01.09-31.01.09	Blasting and tunneling technologies for NHPC
37.	CONS/634/2008-09	Ore Mineralogy and Mining for Institute for Mining, Mineralogy, and Metallurgy, BCSIR, Bangladesh
38.	CONS/736/2008-09 27.01.09-31.01.09	Blasting and Tunnelling Technologies for NHPC
39.	CONS/0319/2007 (9-7-07 to 13-10-07)	Course for Mining Supervisors of Tata Steel
40.	CONS/0351/2007 17-9-07 to 29-9-07	Two weeks course on “Modern Surveying Instruments for Oil India Ltd (OIL)”
41.	CONS/0351/2007 17-9-07 to 29-9-07	Two weeks course on “Modern Surveying Instruments for Oil India Ltd (OIL)”
42.	Cons/0223/2007 12 Feb – 24 Mar’07	Advances in Mine Surveying Technology
43.	Cons/0235/2007 5-17 March, 2007 & 26 March – 6 April, 2007	Orientation course on Surface Coal Mining for NTPC Executives Trainees

