

Curriculum Vitae

1. NAME : **DEBASIS DEB, PhD**
2. PRESENT POSITIONS : HAG Professor, Mining Engineering
Former Dean, Undergraduate Studies, IIT
Kharagpur
3. POSTAL ADDRESS : Department of Mining Engineering
Indian Institute of Technology, Kharagpur
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4. EMAIL ADDRESS : deb.kgp@gmail.com, deb@iitkgp.ac.in
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6. EDUCATIONAL QUALIFICATION

Examination	Specialization	Department	Institution/Board	Year	GPA/CGPA
Ph.D.	Mining Engineering	Interdisciplinary Mineral Engineering and Engineering Science and Mechanics	The University of Alabama, USA	1997	3.94/4.0
	<i>Dissertation Title: Development of Longwall Strata Control and Maintenance System (LoSCoMS)</i>				
MS	Mining Engineering	Mineral Engineering	The University of Alabama, USA	1994	4.0/4.0
	<i>Thesis Title: An Application of the Tree Classification Method in the Evaluation of Longwall Shield Stability</i>				
B.Tech (Hons.)	Mining Engineering	Mining Engineering	IIT Kharagpur	1990	8.41/10.0
12th	Science		Tripura Board of Secondary Education	1986	82.7% (7 th in the Board)
10th	All Subjects		Tripura Board of Secondary Education	1984	80.5% (8 th in Board)

7. TEACHING AND RESEARCH INTERESTS

A. Teaching Interests

- a. Geomechanics and geotechnical engineering
- b. Computational and numerical methods in geosciences and engineering
- c. Flow through porous media
- d. AI methods and their applications in geosciences
- e. Engineering mechanics (statics and dynamics)

B. Research Interests

- a. Geomechanics and rock engineering
- b. FEM/X-FEM and mesh-free numerical methods in reinforced fractured porous media
- c. SMART Bolts for early warning
- d. Digital Image Correlation (DIC) for contact-free strain measurement
- e. Explosives, blasting and dynamic behavior of rock structures

8. EXPERIENCE (ACADEMIC & ADMINISTRATIVE)

Teaching and research experience about 29 years out of which 20 years at IIT Kharagpur

A. Academic Experience

Designation	Department	Employer	Period
Higher Academic Grade (HAG) Professor	Mining Engineering	IIT Kharagpur	August 2019-present
Professor	Mining Engineering	IIT Kharagpur	Nov 2011-July 2019
Associate Professor	Mining Engineering	IIT Kharagpur	April 2007-Nov 2011
Assistant Professor	Mining Engineering	IIT Kharagpur	January 2001-March 2007
Visiting Researcher	Ground Control and Rock Engineering	Korea Institute of Geoscience and Mineral Resources (KIGAM), Daejeon, South Korea	August 2004-July 2005
Visiting Asst. Professor	Mining and Mineral Resource Engineering	Southern Illinois University Carbondale, USA	January 1999-December 2000
Assistant Scientist	Mining and Mineral Resource Engineering	Southern Illinois University at Carbondale, USA	September 1998-January 1999
Researcher III	Mining and Mineral Resource Engineering	Southern Illinois University at Carbondale, USA	June 1998-September 1998
Research Associate	Civil and Environmental Engineering	The University of Alabama, USA	1997-1998
Graduate Research Assistant	Mineral Engineering	The University of Alabama, USA	1991-1997

a. Teaching:

- 2000-present Rock Mechanics, Computational Geomechanics, Tunneling, Introduction to Petroleum Engineering, Applied Geostatistics, Principles of Mine Planning, Computer Applications in Mineral Industries
- 1998-2000 Mechanics of Rigid Bodies (Statics), Advanced Ground Control, Probability and Statistics for Engineers, Design of Mine Excavations and Advanced Mining Systems, Rock Mechanics Laboratory
- 1996-1998 Instructor for a section of Mine Design course
- 1996-1998 Trainer for Use of LoSCoMS for mine personnel

Courses Taught: Undergraduate Courses

Rock Mechanics: Rock characterization, rock mass classification system, insitu stresses, stresses around underground openings, pillar design, subsidence, slope stability

Applied Geomechanics: Principles of rock mechanics are taught in this course. This course has also extended to finite element method, surface subsidence, slope stability analysis and a laboratory experiments.

Tunneling: Tunnel design methods, stresses around tunnels, tunnel construction methods in soft and hard rocks, TBM, ventilation in tunnels, economic analysis of tunnel construction

Introduction to Petroleum Engineering: Reservoir estimation, reservoir performance, permeability and porosity, drilling methods, geology of reservoir rocks

Computer Applications in Mineral Industry: This course composed of various computer algorithms used in mining industry. It is a laboratory oriented course where students write programs to simulate various mining activities and design of support systems.

Applied Geostatistics: This course deals with various techniques of statistical and geostatistical principles for spatial analysis of ore body. The students are also asked to use software to obtain Kriging estimate and variance of various field problems.

Design of Mine Excavation: A mine design course composed of five design projects for senior mining engineering students. Design projects are 1) coal mine panel design including entry stability, roof control and ventilation; 2) slope stability for open pit mine; 3) soil stability; 4) mine shaft and tunnel design; 5) subsidence analysis over underground mines.

Probability and Statistics for Engineers: Introduction to probability and statistical theories for solving engineering problems. This course includes probability theories and various random and continuous probability distributions, sampling theory and analysis, hypothesis testing and simple linear regression.

Mechanics of Rigid Bodies-Statics: Introduction to statics to sophomore students. This course includes vector operations, equilibrium, moment of Inertia, trusses, frames and mechanics, friction, center of gravity, center of mass, centroid, etc.

Rock Mechanics Laboratory: Introduction to rock mechanics laboratory for senior mining engineering students. This course comprises of various experiments such as rock core preparation, uni and tri axial strength test, strain gauge mounting, tensile strength test, specific gravity test, etc.

Mine Design: Mine design project for senior students. In this course, students learn how to use AutoCAD and Eagle Point software to generate mine maps, elevation and isopach contour, panel layouts, port entry, etc. VNETPC software was also used to layout ventilation networks for the proposed mine.

Graduate Courses

Computational Geomechanics: It is an advanced level course for graduate students. This course comprises of various numerical tools for solving problems in rock mechanics and geomechanics. Students gain knowledge about FEM and other computing techniques as a solution to various problems.

Advance Ground Control: This course includes modern techniques for ground control in room and pillar and longwall mining. Stress redistribution around mine opening, pressure-ach theory,

primary and secondary support systems, in situ stresses, pillar design, rock mass systems, shield pressure analysis and subsidence are some of the topics of this course.

Advanced Mining Systems: This course is designed for graduate students to provide advance knowledge for innovative mining technique such as longwall mining. It includes various design techniques, ground control, ventilation, operations and remote control techniques applied to longwall mining.

Advanced Rock Mechanics or Computational Rock Mechanics: This course provides advance knowledge of rock mechanics to graduate students. One of the major parts is application of Finite Element Method (FEM) in mine design. It includes longwall mine design projects using FEM.

b. Research for Product Development

i. Setup Design:

- ✓ Design and developed new equipment and instruments, namely, Instrumented Rock Bolt (INFOBOLT)
- ✓ An Improved and Highly Economical Instrument/Tool for Measuring Velocity of Detonation of Various Types of Explosives and Initiators and Scattering/Delay Timing of Accessories Products and The Method for the Same (ACCUTIME)
- ✓ 3D Non-Contact Type Rock Surface Profiler

ii. Computer Programming:

- ✓ 1998-1999 Development of Coal Mine Roof Rating (CMRR) Computer Program using Visual Basic for NIOSH
- ✓ 1992-1997 Development of Longwall Strata Control and Maintenance System (LoSCoMS) using WINDOWS C/C++, SDK and VISUAL C++. Copyrighted by The University of Alabama, 1996
- ✓ 1995 Application of Genetic Algorithms for Optimizing Longwall Panel Dimensions
- ✓ 1994 Development of an Expert System for Longwall Shield Selection

iii. Longwall Shield Pressure Data Acquisition:

- ✓ 1995-1997 Installation of surface data acquisition system from headgate to the surface computer in Shoal Creek Mine operated by Drummond Company, Inc., Alabama
- ✓ 1995 Installation of underground data collection system from the headgate to underground computer in Jim Walter #3 Mine, Alabama,
- ✓ **Others:** Mining, Geographic Information System (GIS) and Mapping Software Executive from 1990 to 1991, Rolta India Ltd., India. Provided customer services to geological and mining companies.

B. Administrative Experience

a. Institute Assignments

- i. Dean, Undergraduate Studies, January- October, 2020
- ii. Head of the Department, Mining Engineering, IIT Kharagpur, 2017-2019
- iii. Chairman, Career Development Centre (CDC), 2016-2018
- iv. Chairman, GATE, 2012-2013
- v. Vice-Chairman, GATE, 2010-2012
- vi. Co-Coordinator, DeySarkar Centre of Excellence in Petroleum Engineering, IIT Kharagpur, 2015-present
- vii. Warden, RK Hall, 2014-15

b. Department Assignments

- i. Head of the Department, 2017-2020
- ii. President, Technology Mining Engineering Society (TMES), 2008-2010
- iii. PhD Research Coordinator, 2014-15
- iv. Chairman, GREATSTEP, 2009-10
- v. PIC, Rock Mechanics laboratory, 2011-present
- vi. PIC, Computational Geomechanics laboratory, 2011-present
- vii. Faculty Advisor, 2009-10 batch

c. Additional Assignments

- i. Member of Governing Body, International Center of Excellence in Mining Safety & Automation (iCEM), Ahmadabad, Gujarat, 2016-present
- ii. Academic Program Mentor, Indian Institute of Petroleum and Energy (IPE), Vishakhapatnam, 2016-present
- iii. Member, Board of Studies, Mining Engineering, Kakatiya University, Warangal, 2015-present
- iv. Member, Board of Studies, Orissa School of Mining Engineering, Keonjhar, 2015-present
- v. Member, Board of Studies, Indian School of Mines (ISM), Dhanbad, 2014-15
- vi. Academic Partner, iCEM, 2013-2016

9. SPONSORED PROJECTS (IN LAST 10 YEARS)

Sl.No	Title of the Project	Name of the Client & Address	Date of Commencement of work	Amount (in Rs.)
1	Indigenous Development of IoT Enabled Technology for Monitoring, Analysis and Interpretation of Longwall Shield Pressures for Improving Safety and Productivity	MINISTRY OF COAL	December 01, 2020 (3 years)	3,67,16,000
2	Blind Backfilling of Unapproachable Underground Mine Workings/Voids Using Suitable Mix of Fill Material and Method of Filling	TATA STEEL LIMITED	21-02-2019 9 months	30,37,000
3	Development of a Novel Underground Mining Method for Exploitation of Chromite Deposits from Friable Orebody and Host Rocks of Sukinda Valley, Odisha	MINISTRY OF MINES	19-03-2018 3 years	68,46,000
4	Development of 3D-Geomechanical Model for Stability Analysis of Borewell	CEWELL ONGC	April 2016 3 years	71,81,750
5	Insitu Litching of Uranium	ONGC Energy Trust	March 2016 2 years 06 months	4,13,57,000
6	An automated servo-controlled direct shear cum triaxial testing machine with computer control system and power pack (SGDRI)	SRIC, IIT Kharagpur	15-05-2014	2,50,00,000

Sl.No	Title of the Project	Name of the Client & Address	Date of Commencement of work	Amount (in Rs.)
7	Study on mill tailings based composites as backfill material in turmmalapalle Uranium Mines, Andhra Pradesh	Bhabha Atomic Reserach Centre (BARC)	01-07-2013 3 years	43,28,000
8	Stope design and stability, production planning and paste backfilling to produce 5 million tonne per annum ore from Malanjkhand underground copper mine	Hindustan Copper Limited (HCL)	01-07-2013 3 years	1,19,69,760
9	Development of Indigenous Tools for carrying out Random Sampling & Testing of Explosive and Accessories used in mines of Coal India Limited	CMPDI (Coal India Limited)	Jan-2012 1 year	2,98,00,000
10	Investigation of Bolt Behavior in Development and Depillaring Panels under Blast Induced Dynamic Loading	CMPDI, Coal India Limited, Ranchi,	01-02-2011 3 years 13 months	2,29,54,000

10. CONSULTANCY PROJECTS (IN LAST 10 YEARS)

Sl. No.	Title of the Project	Name of the Client & Address	Date of Commencement & Duration	Project Cost (Rs.)
1	Stability Analysis of Stopes in Banwas Block of Khatri Copper Mine of Hindusthan Copper Ltd	Hindustan Copper Limited,	2020, 1 year	12,95,109.00
2	Geo-Mechanical Testing/Determination of Geotechnical Properties of Samples From Core Drilling Programme for Development of Underground Project at South Kaliapani Chromite Mine	The Odisha Mining Corporation Ltd	2020, 1 year	32,40,764.00
3	Slope stability analysis to finalize the method of working, ultimate pit slope, dump slope and monitoring of amod g-19 (extn.) Lignite mine	Gujarat Mineral Development Corporation	2020, 1 year	15,93,000.00
4	Strata Behavior and Support Design of Bangur Chromite Mine	The Odisha Mining Corporation Ltd	2019, 6 months	8,60,000.00
5	Slope Stability Analysis of Dump-C of Pakri Barwadih Coal Mining Project	NTPC Limited	2019, 9 months	9,15,680.00
6	Slope Stability of common Boundary Dump	IMFA (Indian Metals & Ferro Alloys Limited), Bhubaneswar, Odisha	22-03-18 6 months	3,72,762.00

Sl. No.	Title of the Project	Name of the Client & Address	Date of Commencement & Duration	Project Cost (Rs.)
7	Common boundary dumping and slope stability study	M/s. Balasore Alloys Limited, Kaliapani Chromite Mines Jajpur Odisha	08-03-18 6 months	5,97,375.00
8	Feasibility study of mining by Cut & Fill method of Lode – 1 and Lode FWA – 1 of Turamdih Mine	Uranium Corporation of India Limited	15-01-18 6 months	11,62,890.00
9	Estimation of Safe distance between slope crest and toe of Dump – 3 with deepening of the PIT in Kaliapani chromite Mine	M/s. Balasore Alloys Limited, Kaliapani Chromite Mines Jajpur Odisha	01-10-17 6 months	9,76,509.00
10	Design and Stability analysis of LD slag Dump at Guludih and Bhatkunda	M/s Tata Steel Limited, Jamshedpur	01-09-17 6 months	10,30,140.00
11	Feasibility study of mining by Cut & Fill method of Turamdih Mine under a public road and thatched houses	Uranium Corporation of India Limited	12-12-17 6 months	6,88,180.00
12	Monitoring of Slope Movement of Benches at Banduhurang Opencast Mine	Uranium Corporation of India Limited	11-12-17 1 year	4,67,870.00
13	Preparation of Mining Scheme to Produce 550 TPD ore on sustainable manner from existing mohuldih mine	Uranium Corporation of India Limited	24-05-17 6 months	15,53,000.00
14	Advanced Analysis and Vetting and Valication of Blast Vibration Studies of Bauxite	M/s. Bhubaneswari Coal Mining Ltd, Telcher, Odisha	12-07-17 4 months	3,54,400.00
15	Prefeasibility study on Geotechnical Stability of an Underground Laboratory at Jaduguda, UCIL	Uranium Corporation of India Limited	09-03-17 4 months	3.30,400.00
16	Applied rock and Soil Mechanics related works for Mine Design System in BAL Mines	M/s. Balasore Alloys Limited	01-05-16 3 years	15,69,750.00
17	Monitoring of Strata Movement of slope Benches in Kaliapani Chromite Mines Operated by Balasore Alloys Limited	Balasore Alloys Limited	02-11-2016 1 Year	3,50,660.00
18	Rock Parameter Study of Turamdih Mine	UCIL	16-06-2016 1 month	1,38,948
19	Rock Parameter study at Bandurang opencast Mine	UCIL	03-05-2016 1 month	1,20,784

Sl. No.	Title of the Project	Name of the Client & Address	Date of Commencement & Duration	Project Cost (Rs.)
20	Techno Fesibility study on stability analysis of proposed Road in Chromite Mines.	Jindal Stainless Steel Ltd,	28-04-2016 1 month	4,65,800
21	Stope Stability Analysis for Jindal Chromite Mines - Kaliapani	Jindal Stainless Limited, Jajpur	18-04-2016 8 months	12,69,060
22	Blast Vibration Study at Mahagiri Mines (Chromite)	IMFA	05-01-2016 5 months	2,91,000
23	Slope Stability for working and Ultimate pit at TRB Iron Ore Mine, Tensa	Jindal Steel & Power Limited,	01-01-2016 4 months	10,51,110
24	Monitoring of Stratra Movement of slope Benches in Kaliapani Chromite Mines Operated by Balasore Alloys Limited	Balasore Alloyes Limited	02-11-2015 12 months	3,50,660
25	Review and Modification of Existing Systematic Support Rule (SSR) to Control Failure of Immediate Shale Roof strata above IX seam of Digwqdi and 6 & 7 Pit	Tata Steel Limited, Jamadoba Group	07-01-2015 12 months	8,80,080
26	Technical Opinion on safe Mining at GMDC'S Lignite	M/s. G.M.D.C	25-08-2014 3 months	7,50,850
27	Further Investigation/study on stability of Sub-level experimental stope	Uranium Corporation of India Limited,	02-05-2013 1 month	1,54,830
28	Geotechnical Testing of Bore Hole Samples (GBHS)	M/s. Balasore Alloys Ltd,	01-05-2013 12 months	54,12,960
29	Consultancy Services for validation of Slope Stability Analysis Report for Mining Project at Liberia (Job No. 6970A)	Tata Consulting Engineers Limited	01-04-2013 1 month	67,416
30	Evaluation of Ultimate Pit plan of Malanjkhanda Open Pit Mine of Hindustan Copper Ltd,	M/s. Hindustan Copper Limited,	06-01-2013 9 months	4,21,200
31	Study of slope stability of Benches and Waste Dump at Banduhurang Opencast Mine	Uranium Corporation of India Limited	01-01-2013 12 months	7,35,680
32	Geotechnical Study for Subsidence of Sukinda Mines of Balasore Alloys LTD	M/s. Balasore Alloys Ltd	13-09-2012 1 month	1,46,000
33	Testing of Core Sample and Soil Sample	M/s. Balasore Alloys Ltd	13-09-2012 1 month	2,12,360
34	Fesibility Study of Sublebel in lode-4, F/W-A	Uranium Corporation of India Limited	10-09-2012 3 months	3,92,920
35	Geotechnical study at Kaliapani Chromite Mines of Balasore Alloys Limited. (Phase – I, Phase – II and Phase – III)	M/s. Balasore Alloys Limited	09-07-2012 11 months	21, 21,019

Sl. No.	Title of the Project	Name of the Client & Address	Date of Commencement & Duration	Project Cost (Rs.)
36	Geotechnical Instrumentation, Monitoring and Data Analysis for open blast hole stoping at Khetri Copper Mine(Underground)	Hindustan Copper Limited,	01-11-2011 14 months	7,12,650
37	Geotechnical Study of Enhancement of Waste Dump Height at our Sukinda Mines (Chromite)	INDIA METALS & FERRO ALLOYS LTD IMFA Group,	26-09-2011 4 months	4,93,480
38	Study of Pit Slope Stability in Kaliapani Chromite Mines of	M/s. Balasore Alloys Ltd,	24-09-2011 4 months	3,57,000
39	Uniaxial and tensile strength test of core and block sample of Jungle and Maheswar Lode, Kathpal Mines	Ferro Alloys Corporation Ltd	24-06-2011 1 month	63,422
40	Time and Motion study of Dumper and Shovels in Kaliapani Chromite Mine of Balasore Alloys Ltd.	Balasore Alloys Limited	07-06-2011 2 months	1, 06,109
41	Techno Fesibility study for an Incline shaft and Primary Drivages for Underground Mining in lode No. 6 at Kaliapani Chromite Mines	Balasore Alloys Limited	07-06-2011 12 months	7, 06,910
42	Applied rock and Soil Mechanics works for Mine Design system in UCIL Mines	Uranium Corporation of India Limited	01-04-2011 11 months	9,88,288
43	Coal as Raw Materials for Thermal Power Generation	The Orissa Power Generation Corporation Limited,	09-01-2011 8.5 months	79,416

11. PATENTS (FILED/AWARDED)

- i. **An Instrumented Bolt for measuring strains at different locations (INFOBOLT)**, Filed in India, 2014, Patent Application No. 669/KOL/2014
- ii. **An Improved and Highly Economical Instrument/Tool for Measuring Velocity Of Detonation of Various Types of Explosives and Initiators and Scattering/Delay Timing of Accessories Products and The Method for the Same (ACCUTIME)**, Filed in India, 2013, Patent Application No. 1091/KOL/2013
- iii. **3D Non-Contact Type Rock Surface Profiler, filed patent in India, 2009**, Patent Application No. 1143/KOL/2009
- iv. **MAXPIT Software, obtained patent in South Korea, 2007**, an user friendly software for determining the optimum pit geometry and pit values

12. NAMES OF REPUTED AWARDS/HONORS/RECOGNITIONS

- i. "Research Advisor" Nan Yang Academy of Sciences, Singapore 2019
- ii. National Geoscience Award-2013 for outstanding contribution in Mining Technology
- iii. Best Paper Award, INDOROCK - 2011
- iv. Smt. Bala Tandon Award (2008-2009)

- v. MGMI Silver Medal 2009
- vi. Hindustan Zinc Gold Medal Award, 2008
- vii. MGMI Gold Medal for the Best Paper, 2007
- viii. Young Scientist Award, 2002
- ix. Sukumar Rakshit Award for Outstanding Contribution in Rock Mechanics and Mine Support Design for the Year 2001-2002
- x. Service and Leadership Scholarship, Civil and Environmental Engineering Department, The University of Alabama, 1998
- xi. 1995 Best Paper Award, “Role of Longwall Gob Formation in Coalbed Methane Emission”, International Unconventional Gas Symposium, Tuscaloosa, Alabama, (with Patton, Jiang, Novak and Park)
- xii. 1989 First Prize in Mining Division of All India Student Design Competition Organized by Institute of Engineers, India (1989)
- xiii. 1986-1990 Merit-Cum-Means (MCM) Scholarship, Government of India
- xiv. 1982-1986 National Merit Scholarship, Government of India

13. EDITORIAL BOARD MEMBER

- i. Editorial Board Member of Geotechnical and Geological Engineering, Springer
- ii. Editorial Board Member and Associate editor of Arabian Journal of Geoscience, Springer

14. Ph.D. GUIDED (COMPLETED OR IN-PROGRESS)

A. Completed

Sl. No.	Name of the student	Year of graduation	Title of Thesis
1	Abhiram Kumar Verma	2007	Finite Element Analysis and Forecasting of Longwall Ground Control Problems Using Statistical Techniques
2	Gnananda Budi	2009	Experimental and Finite Element Analysis of the Shear Characteristics of Rock Joints
3	Ajay Kumar Jha	2009	Evaluation of Damages Caused by Surface Blasting to Adjacent Underground Workings
4	Kiran Yirrakula	2011	Hydrodynamic Modeling of Subarnarekha River for Assessing Flood Affected Areas
5	Kamal Chandra Das	2013	Extended Finite Element method and Applications in Reinforced Jointed Rock Mass
6	Hemant Kumar	2015	Stability Analysis of Deep Underground Excavation by Field Measurements and Numerical Modeling
7	Ranjan Pramanik	2015	Development of Numerical Procedures in Smoothed Particle Hydrodynamics for Analysis of Failure Process in Geomaterials
8	Nibedita Sinha	2016	Evaluation of Soil Erosion Potential at a Proposed Openpit Mine Site in a Hilly Terrain using Remote Sensing and GIS Technology
9	Sudipta Bhattacharjee	2016	Analysis of Failure Mechanism in Geomaterials using Extended Digital Correlation Technique
10	Islavath Sreenivasa Rao	2017	Stability analysis of longwall face vis-vis structural analysis of power supports
11	Sandeep Panchal	2018	Development of Flowable Mill Tailing based Paste Backfill Composite for Placement in Underground

Sl. No.	Name of the student	Year of graduation	Title of Thesis
			Mines
12	Arijit Khan	2019	Development of a Coupled FEM-SPH Method for Dynamic Analysis in Geomechanics
13	Sumant Mohanto	2020	Stability Analysis of Large Diameter Blasthole Stopes due to Blast Induced Dynamic Load using 3D Numerical Modeling
14	Tufan Ghosh	2020	Mathematical Modeling of Two-phase Flow through Homogeneous and Heterogeneous Reservoirs

B. Registered

Sl. No.	Name of the student	Expected Year of graduation	Broad Research Area
1	Yashwanth Gujjala*	2020	Rock-Fluid Interactions
2	Yugul Kishor	2020	Design of Underground Metal Mine Using Numerical Methods and Geotechnical Risk Assessment Techniques
3.	Gopi Krishna Dondapati	2020	Experimental and numerical studies on roof support system
4	Sujeet Bharti	2021	Analytical and experimental analysis on the behavior of rock joints
5	Jemish Modi	2021	Rock and bolt interactions
6	Chammanth Sai Reddy	2021	Development of a digital image correlation hardware and software for health monitoring of structures
7	Srikant Katkuri	2021	Analysis of longwall gate road behavior using field monitored data
8	Shashank Sharma	2021	Experimental and numerical studies on hydro-fracking
9	Kumar Shwetank	2022	Coupled FEM-SPH for analysis of hydrofracking phenomena
10	Sruti Nawal	2022	Numerical and experimental modelling of tunnel behaviour
11	Nimesh Nirbhay	2022	Experimental and field investigation of reinforced jointed rock mass
12	Subham Srivastava	2022	Experimental analysis of dump material in regards to slope stability
13	Akshay Chandan Dey (MS)	2020	Petroleum geomechanics

* Synopsis is submitted in November, 2020

C. Enrolled

Sl. No.	Name of the student	Expected Year of graduation	Broad Research Area
1	Prakash Jat	2023	Strata control of mine structures in squeezing ground
2	Sonu Kumar Pasi	2023	Experimental analysis of backfill material composed of limonitic overburden rock
3	Anupal Jyoti Dutta	2024	Exploration Aspects of geothermal energy in India
4	Subhadip Maiti	2024	Production of geothermal energy: an experimental investigation

15. BOOKS AND PROCEEDINGS

- i. Text book Author: **Fundamentals and Applications in Rock Mechanics**” Publisher: PHI Learning PVT. Ltd., published in the year 2016, ISBN: 978-81-203-5182-0, Co-Author: Prof. A. K. Verma
- ii. Text book Author: **Finite Element Method: Concepts and Applications in Geomechanics-2nd Edition**, Publisher: PHI Learning PVT. Ltd., published in the year 2012, ISBN: 978-81-203-4295-8
- iii. Text book Author: **Finite Element Method: Concepts and Applications in Geomechanics**, Publisher: Prentice-Hall India, ISBN: 81-203-2983-X, 284 pages, 2006
- iv. Proceedings Editor: **Geoscience and Technology: Utilization of Geospace as a Solution for Energy and Environment**, IIT, Kharagpur, 2008
- v. Proceedings Co-Editor: **Technology and Management for Sustainable Development of Minerals and Natural Resources**, IIT, Kharagpur, 2004

16. COMMITTEE MEMBER OF Ph.D. DISERTATIONS

Number of students : 35
Research Topics : Bearing Capacity of weak floor, Development of material for trapping the pillar, GIS based mine closure planning, financial aspect of mining, safety in mining, structural behavior of concrete

17. ADVISOR FOR M. Tech. /DD THESIS

- vi. Number of students: 46
- vii. Research Topics: Development and application of finite element methods in rock mechanics, joint analysis, utilization of fly ash, image processing

18. ADVISOR OF M.S. THESIS

Number of students: 4
Research Topics: Remote sensing, image processing, ground water modeling, backfilling

19. PUBLICATIONS IN INTERNATIONAL AND NATIONAL JOURNALS

- [1] Gujjala Y. K., **Deb D.** and Nirbhay N., 2021, “Performance of Reinforcement Bar in Jointed Samples under CNL Direct Shear Tests, *ASCE International Journal of Geomechanics*, DOI: 10.1061/(ASCE)GM.1943-5622.0002011
- [2] Gujjala Y. K. and **Deb D.**, 2020, “Enriched numerical procedures for bolt reinforced fully saturated fractured porous media”, *International Journal of Rock Mechanics & Mining Sciences*, 136 (2020) 104527, <https://doi.org/10.1016/j.ijrmms.2020.104527>
- [3] Khan A. and **Deb D.**, 2020, “An Adaptive Coupling of Finite Elements with SPH Particles for Large Deformation Fluid-Solid Interactions”, *Computational and Mathematical Methods* Vol. 4, pp. 21 <https://onlinelibrary.wiley.com/doi/pdf/10.1002/cmm4.1137>
- [4] Ghosh T., **Deb D.**, Raja Sekhar G.P., 2020, “Non-classical flow modeling of spontaneous imbibition in spatially heterogeneous reservoirs”, *Computational Geosciences* 24:1445–1461, <https://doi.org/10.1007/s10596-020-09967-0>
- [5] Islavath S. R., **Deb D.** and Kumar H., 2020, “Development of a roof-to-floor convergence index for longwall face using combined finite element modelling and statistical approach” *International Journal of Rock Mechanics & Mining Sciences*, 127 (2020) 104221, <https://doi.org/10.1016/j.ijrmms.2020.104221>
- [6] Prasad V. N. S.M, **Deb D.**, Kumar A. and Mishra A. K., 2020, “An Algorithm for Evaluation of Mining Cycle Parameters and Analysis of Periodic Roof Weighting Using Monitored Longwall Shield Pressures and Shearer Location, *Mining, Metallurgy & Exploration*, <https://doi.org/10.1007/s42461-020-00361-z>
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21. INVITED LECTURES/SHORT-COURSE OFFERED FOR INDUSTRY/ACADEMIA

- 2020 “Digitization of Mining System: Mining 4.0”, Webinar organized by NIT, Surathkal
- 2019 “A Sustainable Ecosystem for Applied Research in Mining Industries by Creating a Platform for Vibrant Start-ups”, Conference organized by DGMS, Hyderabad
- 2019 “Strength of Jointed Rock Mass with Application in Slope Stability”, Workshop organized by NIT, Surathkal
- 2010 “Applications of Numerical Methods in Rock Discontinuity and Reinforcement”, 55th ISTAM Congress, NIT, Hamirpur

2009	“Numerical Analysis of Rock Blasting”, VNIT, Nagpur
2009	“Ground Control in Underground Mines” in short course Industrial Safety Engineering for TATA Steel Officials organized by IEM Department, IIT, Kharagpur
2009	Lecture delivered to CIL Executives at Indian Institute of Coal Management (IICM), Ranchi
2007-08	“Slope Stability in Rocks and Soils” delivered at IIT, Kharagpur
2007	Lecture delivered on Subsidence in Civil Engineering Department, Seoul National University, Seoul, Korea
2007	Lectures delivered Open Pit Stability in KIGAM, Korea
2005	Lecture delivered on Applications of Numerical Methods in Rock Engineering in Civil Engineering Department, Youngdong University, Korea
2005	Lecture delivered in Civil Engineering Department, Seoul National University, Seoul, Korea
2004	Lecture delivered in Civil Engineering Department, Andong National University, Andong, Korea
2004	Short Course on “Advances in Geomechanics for Mining and Tunneling Applications”
2002~03	Analysis of Roof and Rib Fall Incidents: A Ground Control Perspective
2001	Applications of GIS in Mine Planning, Strata Mechanics for Coal Mines
2001	Underground Mining: Methods and Machinery

22. ORGANISED NATIONAL/ INTERNATIONAL CONFERENCE/ COLLABORATION

- a) Organized Joint Indo-Korean International Conference on “Geoscience and Technology: Utilization of Geospace as a Solution for Energy and Environment” as Convener
- b) Organized International Conference on “Technology and Management of Sustainable Exploitation of Natural Resources” as Co-Convener
- c) Instrumental in developing relationship and MOU between IIT, Kharagpur and Korean Institute of Geoscience and Mineral Resources (KIGAM)

23. ADMINISTRATIVE WORK IN THE INSTITUTE AND DEPARTMENT

Year	Position	Responsibility
1/2020-11/2020	Dean, Undergraduate Studies	Academic and administrative responsibilities of undergraduates studies having 8000+ students, framing and implementing policies related to UGS. In this COVID Pandemic, I am one of the key persons for steering the Institute towards online education
2014-present	Coordinator of IIT Kharagpur, ONGC-PANIIT	Call for meeting and disbursing project related information to all IITs
2016-present	Co-coordinator, Ashok Deysarkar and Ruma Acharya Centre of Excellence in Petroleum Engineering” established in 2016 at IIT Kharagpur	Development of the syllabus of PE program, shortlisting of candidates for faculty position, regular meeting with the existing faculty member and development of labs
2016-present	Member, Mentor Group, Indian Institute of Petroleum and Energy (IPE) established in Vishakhapatnam	Preparing course curricula of Petroleum Engineering, regular meeting with the faculty members, shortlisting and interviewing the candidates for faculty position

2017-2019	Head of the Department, IIT Kharagpur	The entire administrative works for smooth functioning of the department having 600+ students, 20 faculty members and 4 staff members. During this tenure, I have recruited 5 faculty members in the department
2016-2018	Chairman, CDC	Responsible for training and placement of 2000+ students, Meeting with company executives and propagation of the various academic initiatives that IIT is taking, Understanding their concerns and providing solutions, Delivering lectures to the students regarding on-going placement and internship prospects, their career choices and others, Making new initiatives to improve the day-to-day working of CDC
2014-2016	Vice-Chairman, CDC	Listening to the problems of students and providing solutions, meeting with company executives, conducting career related workshops, pre-placement tests, helping to run the CDC office smoothly during peak seasons
2014-15	Warden, RK Hall	Conducting smoothly the day-to-day business of hall, coordinating with mess and maintenance manager, providing amicable solution to any dispute
2013-14	Chairman, GATE	Coordinating with other IITs and IISc, Bangalore, overseeing all arrangement are made for smooth conducting of both the exam in online and off-line modes
2011-13	Vice-Chairman, GATE	Conducting GATE and JAM examinations and publishing results, identifying exam centres in various cities in India, arranging accommodation, travel plan of IRs and others

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