

Legacy that Inspires the Future

भारतीय प्रौद्योगिकी संस्थान
भारतीय खनि विद्यापीठ
धनबाद



IIT INDIAN INSTITUTE
OF TECHNOLOGY
ISM INDIAN SCHOOL OF MINES
DHANBAD

Department of Petroleum Engineering

NEWSLETTER
PETROELITE

VOL 1
SEP 2024



Unlock the latest news and insights

About the Department

The Department of Petroleum Engineering at Indian Institute of Technology (Indian School of Mines), Dhanbad was established in the year 1957 to make its mark in the Oil and Gas Industry in the country. Subsequent developments, under the guidance of a series of distinguished educators, renowned personalities from the oil and gas industry and scientists, have led the department to the forefront of research and teaching in Petroleum Engineering. The Department offers B. Tech, M. Tech and PhD programs.

Message from HoD's Desk



Prof. Keka Ojha
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Kekaojha@iitism.ac.in**

At the Department of Petroleum Engineering at IIT (ISM) Dhanbad, we are committed to developing professionals who are prepared to lead in the ever-evolving energy sector.

Our department is equipped with state-of-the-art research facilities and laboratories, enabling our students and faculty to engage in cutting-edge research and innovation. These facilities provide a robust platform for exploring new technologies and methodologies, addressing complex industry challenges, and contributing to the sustainable development of the energy sector.

Through rigorous academic training, access to advanced research resources, and active engagement with industry projects, our students gain valuable insights into real-world challenges and develop the critical thinking skills needed to address them. We emphasize innovation, interdisciplinary learning, and sustainability, ensuring our graduates are not only technically proficient but also adaptable and forward-thinking.

As our student embark on their professional journeys, I am confident they will continue to contribute significantly to the advancement of the energy industry.

R & D Project Sanctioned

- **Prof. V.K. Rajak** awarded project titled “Development of Advection-Diffusion Based Chemo-Thermo-Physical Model for Postfracturing Pressure Build-up in Shale Formations” by DST (SERB)
- **Prof. T K Naiya, Prof. Ajay Mandal & Prof. N K Maurya** awarded the project entitled “Synthesis of Bio-Based Zwitterionic surfactant for use in Enhanced Oil recovery (EOR) at High Reservoir Temperature Conditions” by SERB(CRG)
- **Prof. Ajay Mandal, PI, and Prof. Keka Ojha, Co-PI** awarded project entitled “Developments Tailor-made Surfactants for application in enhanced oil recovery” funded by Syntron Industries Private Limited, Ahmedabad, Gujrat
- **Prof. Rajeev Upadhyay, PI, and Prof. Ashutosh Kumar, Co-PI** awarded project entitled “Reservoir Characterization of Raniganj CBM Field Through Pressure Transient Analysis (PTA)” by Essar Oil and Gas Exploration and Production Limited, Durgapur
- **Prof. Renu V, CE, PI , and Prof. Archana, PE, Co-PI** awarded project entitled “A Novel Modeling Approach for Selecting Suitable Intrinsic Bioremediation Strategies for Attenuating Oil Spills in Coastal Aquifers” funded by SERB(CRG).
- **Prof. Prof. Mohammed Hamid Siddique, PI** awarded project entitled “Calibration of vertical oil storage tanks in India” by Bureau of Indian Standards.
- **Prof. Ajay Mandal, PI,** awarded project entitled “Hot Nanofluid Injection for Enhanced Oil Recovery: Design and Mechanism Development” by Hindustan Oil Exploration Company Limited
- **Margdarshan Scheme** by All India Council for Technical Education team comprises Chief Coordinator : Prof. Vikas Mahto, PE , Coordinators, Prof. Rajeev Kr. Ranjan, ECE, Prof. D.V. Bhaskar, EE, Prof. Vivek Bajpai, MECH , Prof. Gopi Krishna Dondapati, MNE , Prof. Mohammed Hamid Siddique, PE
- **Prof. T K Naiya, Co-PI and Prof. Vipin Kumar, ESE, PI** awarded the project entitled “Developing portable potentiometric bio-sensors for in-situ detection of trace metal pollution (Cd, Pb, Hg and Cu)” Funded by : Department of Biotechnology, Gol.

Externally funded projects other than R&D projects

Prof. Keka Ojha & Prof. Pawan Gupta executed Five-Day Short-Term Refresher Course on “Current Workflows in Oil and Gas Industry” in IIIF Centre, New Delhi.

Prof. Ajay Mandal, CI, Prof. Keka Ojha, Co-CI, and Prof. Tarun K. Naiya, Co-CI awarded the consultancy entitled “Compatibility Study of Fresh Water with Formation Rock and Fluid for Bhaskar Field in Gujarat” by M/s Sun Petrochemicals Pvt. Ltd., Mumbai

Prof. Tarun K. Naiya, CI, Prof. Keka Ojha, Co-CI, Prof. Ajay Mandal, Co-CI, Prof. Chandan Sahu, Co-CI awarded the consultancy entitled “Technical Evaluation of Diesel Samples of Heavy Duty Machineries Used” by Devprabha Construction Pvt. Ltd. by M/s Devprabha Construction Pvt. Ltd., Dhanbad

Prof. Chandan Sahu, PE, CI and Prof. Sarthak S.Singh, MECH, Co-CI awarded consultancy entitled “Study of Optimizing Technological Obstacles Related to Chemical Treatment, ALS and Completion Tools for Production Enhancement and Increasing Well Uptime in CBM Reservoirs” by EOGEL, Burdwan

Prof. Ashutosh Kumar, CI, and Prof. Rajeev Upadhyay, Co-CI awarded the consultancy entitled “Detailed Study on Hydraulically Actuated Artificial Lift (HAAL) Unit vis-à-vis Conventional SRP Unit” by M/s ONGC, Mehsana

Prof. Vinay Kumar Rajak, CI, Prof. Raj Kiran, Co-CI, and Prof. Rajeev Upadhyay, Co-CI awarded the consultancy entitled “Pressure Transient Analysis of Wells of Raniganj CBM Field for Mining Associates” by CI: M/s Mining Associates Private Limited, Asansol

Prof. Rajeev Upadhyay, PE, CI, and Prof. Saurabh Dutta Gupta, AGP, Co-CI awarded consultancy entitled “Subsurface Reservoir Simulation & Modelling Studies to support expansion of field development plan of Raniganj CBM Blocks of Essar Oil and Gas Exploration and Production Limited (EOGEL)” by M/s EOGEL, Durgapur

Prof. Raj Kiran, CI, Prof. Rajeev Upadhyay, Co-CI, Prof. Vinay Kumar Rajak, Co-CI, and Prof. Ashutosh Kumar, Co-CI awarded consultancy entitled “Supervising the Injection/Fall-off Tests and Performing Pressure Transient Analysis in Five Core Holes of Jharia CBM Block of Prabha Energy Private Limited (PEPL)” by M/s Prabha Energy Private Limited, Ahmedabad.

Prof. Keka Ojha, CI, Prof. M. Hamid Siddiqui, Co-CI, and Prof. Neetish Maurya, Co-CI executed Two Day Workshop on “Safety in Oil and Gas Industry” in IIIF Centre, New Delhi.

Prof. Rajeev Upadhyay, CI executed Two day’s EDP on “Coalbed methane- from prospect to pipeline” for M/s Cairn Oil & Gas (Vedanta Limited), Gurugram

Prof. Sayantan Ghosh, CI, and Prof. Ejaz Ahmad, Co-CI awarded consultancy on “Ultimate and Proximate Analyses for the Proposed Underground Coal Gasification (UCG) Pilot Operations in the Gare Palma Sector 1 Project” by M/s Ergo Exergy Technologies Incorporated, Montreal, Canada

Prof. Ashutosh Kumar, CI, and Prof. Rajeev Upadhyay, Co-CI executed EDP Course on “Specialized Training Program on “Hydrocarbon Phase Behaviour and Reservoir Rock and Fluid Properties” for Oil India Limited

Prof. Rajeev Upadhyay, CI, and Prof. Ashutosh Kumar, Co-CI organized 2- days workshop on Coalbed methane (CBM) for executives of ONGC in P&D Directorate office, ONGC Dehradun.

Prof. Ajay Mandal, CI awarded consultancy on “Performance of Synthesized Surfactants for Enhanced Oil Recovery and Interpretation of Results with Detailed Mechanism” by M/s Shah-Schulman Center for Surface Science & Nanotechnology, Nadiad

MOU Signed

- **Aditi Innovations, Muzaffarpur, Bihar**
- **RARA Energy Consulting, UAE**
- **SYNTRON**
- **Ergo Exergy Technology Incorporated**
- **Artson Engineering Ltd**
- **ANP Geoenergy PVT LTD**
- **GERMI**
- **ESSAR**
- **Greenfield Oil and Trading Services Pvt Ltd (GOTS)**
- **Oges Solutions Pvt. Ltd**
- **Schlumberger Solutions Pvt. Ltd**

Patent Title	Filing Date	Status
An Improved Gel Formulation and a Process for Preparing an Improved Gel Formulation by Sujit Mitra, Keka Ojha, Vinod Kumar Gupta, Pandit Vikrant Daksh and Milan Mandal	March, 2023	Filed
A natural, biodegradable kinetic hydrate inhibitor composition and a process for the preparation thereof by Prof. Ajay Suri, Mr. Ankur Singh	20.04.2023	Published

Swayam NPTEL Courses

- Prof. Ajay Mandal is offering a NPTEL course on topic “Enhanced Oil Recovery Techniques”
- Prof. N K Maurya and Prof. Sayantan Ghosh are offering a NPTEL course topic “ Petroleum Formation Evaluation”

Publications

- Yadav, S., Pandey, A., Halari, D., Sharma, S., Saxena, A., Ojha, K. and Joshi, S.J., 2024. The role of nanoparticle–surfactant interactions in air-stabilized foams used for improving oil recovery. *Petroleum Science and Technology*, pp.1-18.
- Jangid, L., Dey, S., Joshi, D., Saxena, N., Ojha, K. and Mandal, A., 2024. Exploring interfacial properties and thermodynamic parameters of synthesized biodegradable surfactants from Brassica Juncea and their emulsification characteristics. *Journal of Molecular Liquids*, 408, p.125326.
- Dutta, R., Kundu, G., Mousavi Mirkalaei, S.M., Chakraborty, R., Yomdo, S. and Mandal, A., 2024. Evaluation of Potential of CO₂-Enhanced Oil Recovery (EOR) and Assessment of Capacity for Geological Storage in a Mature Oil Reservoir within Upper Assam Basin, India. *Energy & Fuels*, 38(15), pp.14096-14118.
- Jangid, L., Dey, S., Joshi, D., Saxena, N., Ojha, K. and Mandal, A., 2024. Exploring interfacial properties and thermodynamic parameters of synthesized biodegradable surfactants from Brassica Juncea and their emulsification characteristics. *Journal of Molecular Liquids*, 408, p.125326.
- Priyanshu Kumar Singh, Dinesh Joshi, Ajay Mandal, Nilanjan Pal. Formulation and Optimization of Silica nanoparticle-stabilized Anionic surfactant microemulsions for application in Enhanced Oil Recovery, Scientific Report, 2024 (Accepted).
- Kumar, V. and Ghosh, S., 2024. Estimation of Vertical Permeability of Hugin Sandstone from Petrophysical Well Logs Using Ensemble Methods: An Enhanced Machine Learning Approach. *Arabian Journal for Science and Engineering*, pp.1-19.
- Gupta, P., Krishna, S. and Maurya, N.K., 2024. Thermodynamic, Rheological, and Electrical Properties of Hydrate Inhibitors: Implications for Natural Gas Production and Flow Assurance. *Energy & Fuels*, 38(16), pp.15284-15294.
- Ansari, M.I., Anwer, S.F., Siddique, M.H. and Alam, T., 2024. Optimization of kinematic parameters of dragonfly wing section in forward flapping flight. *Proceedings of the Institution of Mechanical Engineers, Part G: Journal of Aerospace Engineering*, p.09544100241283365.

From Faculty's Corner

- **Prof. Ajay Mandal** conferred IOGCA 2024 Awards in “Excellence in Chemistry and Chemical Engineering in Oil & Gas Industry and Petrochemical” in upstream oil and gas sector.
- **Prof. Ajay Mandal** conferred award “Energy & Fuels 2024 Excellence in Review”
- **Prof. Ajay Mandal** selected in Stanford/Elsevier Top 2% Scientists List 2024
- **Prof. Ajay Mandal** selected as Guest Editor in “Petroleum Exploration and Production Technology” Journal
- **Prof. Ajay Mandal** have delivered Invited talk on “Estimation of Oil Recovery and CO₂ Storage Capacity in CO₂ and Hybrid CO₂ EOR: Experimental and Simulation Studies’ Cairn Oil & Gas, Gurugram; 13 August, 2024
- **Prof. Ajay Mandal** have delivered Invited talk on “CO₂ EOR & its application in CCUS; SPE Dibrugarh University Students’ Chapter; 17th July, 2024.
- **Prof. Ajay Mandal** attended Conference and present paper: 7th International Oil & Gas Chemistry, Chemicals and Additives Conference & Exhibition (IOGCA 2024)” on 26th & 27th September, 2024 at Hotel Radisson Blu, Dwarka, New Delhi
- **Prof. Rajeev Upadhyay** presented a conference paper on "A preliminary study of quantification of CO₂ sequestration potential and associated incremental methane recovery from Jharia Coalbed Methane (CBM) field considering the CBM reservoir flow dynamics" in the UrjaVarta-2024 held at Bharat Mandapan, New Delhi during 11th - 12th July 2024
- **Prof. Keka Ojha** Presented paper on "Development of Silica Nanoparticle-Enhanced PHPA Hydrogels for Water Shut-Off in High-Temperature and High-Salinity Reservoirs" in IOGCA New Delhi during September 26-27, 2024. and **awarded best paper presenter** in IOGCA New Delhi during September 26-27, 2024

Student's Achievement

Mr. Bhavik Baruah, our current 5th Semester Student, has delivered an admirable performance at the Inter IIT Aquatics Meet 2024, held from October 1st to 5th at IIT Indore. Won three medals: 🥈 Silver (50 m Backstroke), 🥈 Silver (50 m Butterfly), 🥉 Bronze (200 m Freestyle)



Dr. Dinesh Joshi received postdoc opportunity from Khalifa University, Abu Dhabi



IIIF, IIT(ISM) Delhi Centre, NBCC Building, Okhla Phase - 1, New Delhi



Recent Activities at Department



Alumni Corner

Mr. Abhijeet Anand our esteemed alumnus from the batch of 2009-13, has been honored with the 2024 Public Service Award by the Society of Petroleum Engineers (SPE) during SPE ATCE 2024 at New Orleans



Shri Arunangshu Sarkar, our esteemed alumnus from the 1983-87 batch has been appointed as the **First Director (Strategy and Corporate Affairs)** at ONGC on 17 September 2024.

Student Chapter Activities



Inauguration of IADC IIT (ISM) Student chapter

Honored by the presence of our chief guests:

- ◆ Shri Om Prakash Singh - Director Technology & Field Services, Oil and Natural Gas Corporation Ltd & Chairman, IADC SCA
- ◆ Mr. Lars Nydahl Jørgensen - Regional Director, IADC (Denmark)
- ◆ Shri Arun Karle - President, Askara Group
- ◆ Shri Niladri Mitra - Chief Advisor, McDermott International, Ltd
- ◆ Shri Arpit Johri - Asset Manager, ONGC
- ◆ Shri K. Rajendra Babu - GGM, Drilling

FIPI IIT (ISM) Student Chapter successfully organized a webinar on "Introduction to Well Testing" on 10th August. The session was conducted by Mr. Anirudh Bhatt, Field Engineer at SLB, who shared his expertise and practical insights.

FIPI IIT (ISM) Student Chapter successfully organized an informative session on "Introduction to Deep Water Oil and Gas Operations in India" on 16th August. The event featured Mr. Prem Kumar Verma, former President of Exploration and Production at Reliance Industries Ltd. and former Executive Director at ONGC.

FIPI IIT (ISM) Student Chapter successfully hosted an insightful online session on "Chemical Methods of Enhanced Oil Recovery" by Mr. Jinesh Machale, an esteemed alumnus and Postdoctoral Fellow at Memorial University of Newfoundland, Canada.

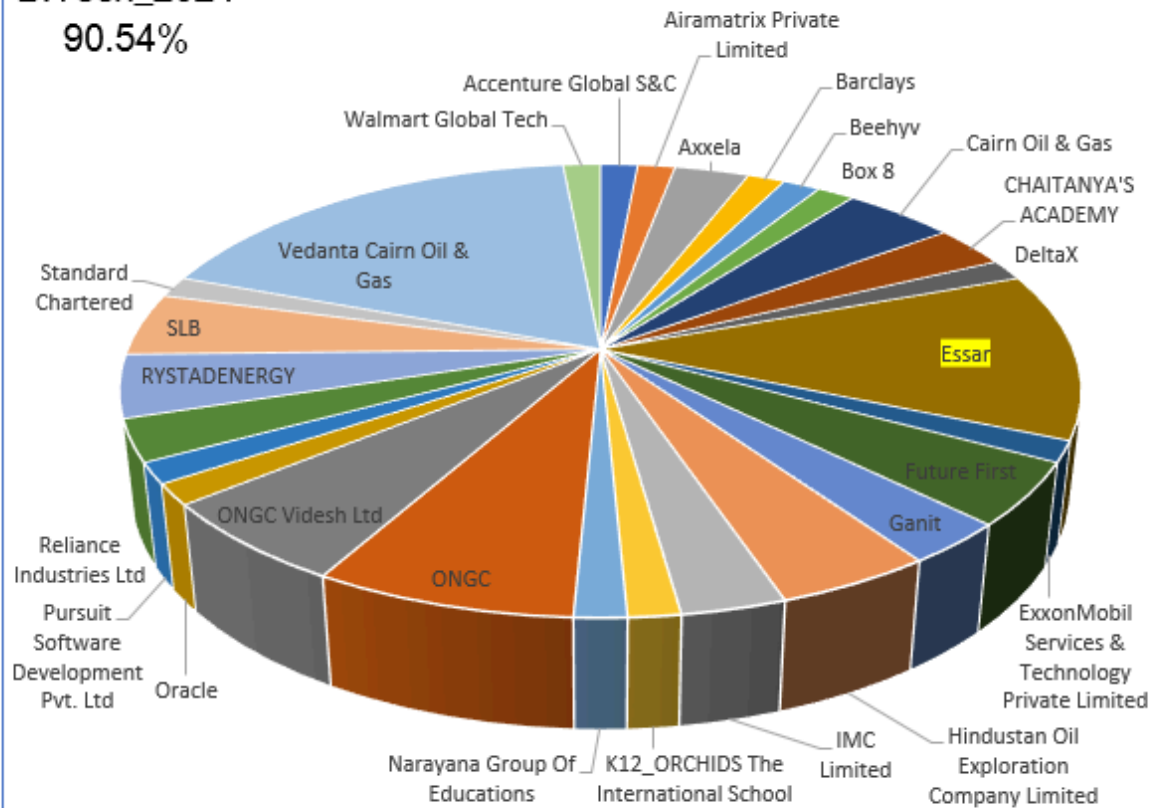
SPE organized webinar on "PLT for Highly Deviated and Horizontal Wells" by Mr. Nicolas Kotlas, Senior Petroleum Engineering at Kappa Engineering.

SPE organized workshop on 'History matching & Production Data Integration' followed by a guest lecture on 'An Efficient Deep Learning Workflow for CO₂ Plume Imaging' by Prof. Akhil Datta-Gupta, a distinguished alumnus of 1982 batch and a faculty member at Texas A&M University.

Placement Statistics 2024

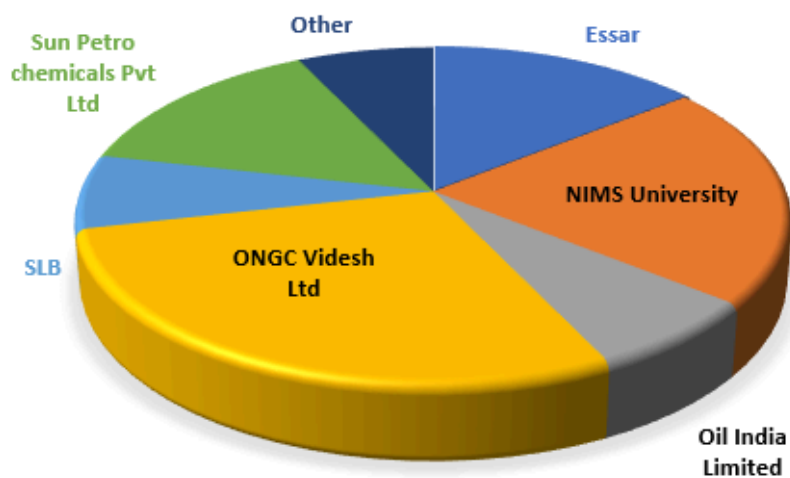
B.Tech_2024

90.54%



M. TECH_2024

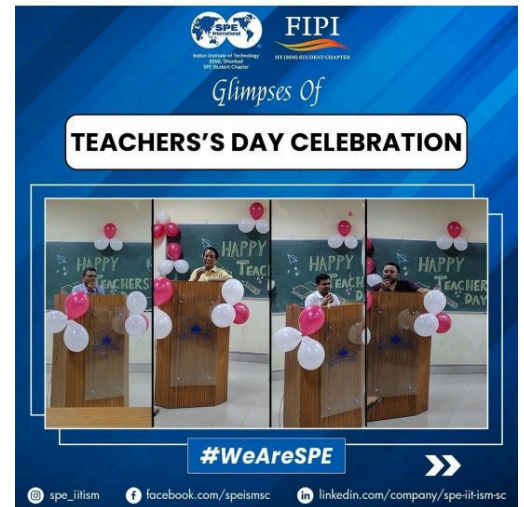
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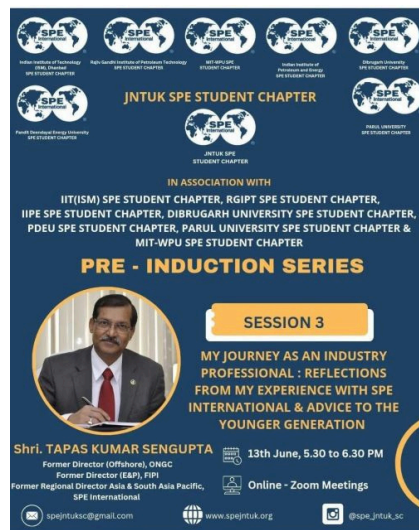


Teacher's Day Celebration by FIPI IIT (ISM) Student Chapter, in collaboration with the SPE IIT ISM Student Chapter

PRAYAS” an initiative with the invaluable support of Fast Forward India to make a significant difference in the education and well-being of underprivileged students."



Invited Guest Lectures



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