Research topics - PhD Admissions Autumn Semester 2026-27

Category: Regular

1. Integrating InSAR-derived deformation and ground geophysical data for landslide hazard zonation in the Western ghats, India.
2. Development of early warning systems using multi-parameter geophysical observations for landslide hazard mitigation in the Western ghats, India.
3. Application of nonlinear signal processing techniques in geophysical data analysis
4. AI-Driven Mineral Exploration Using Geophysical and Geological Data
5. Smart Groundwater Prediction Using Electrical and Electromagnetic Methods
6. Real-Time Landslide Monitoring in the Western Ghats Using Time-Lapse Geophysics
7. Design and Development of a 3D DC-IP System for Advanced Subsurface Imaging (Hardware Focus)
8. High-Resolution Sub-Surface Seismic Imaging using distributed acoustic sensing (DAS).
9. Ambient noise tomography using a dense seismic array for mineral exploration
10. Full-waveform inversion for energy exploration (EX)
11. DAS seismology applications
12. Petrophysics and rock physics of reservoirs of Mumbai Offshore Basin
13. Low contrast Low resistive reservoir modelling of Upper Assam Basin
14. Development of machine learning algorithms for ocean acoustics
15. Estimation of seabed properties in the Indian ocean from underwater acoustic
16. Magnetic field modelling using Swarm satellite data
17. Modelling hydrological loading-induced deformation using GRACE and GRACE-FO observations
18. Multimodal geophysical data inversion for characterizing the thermo-chemical structure and regional-scale geothermal potential
19. Trans-dimensional inversion of satellite gravity gradients to image the density structure of the NW Indian lithosphere
20. Multi-scale Seismic Imaging of the Crust and Upper Mantle Across the NW India-Himalaya-Tibet-Pamir Transect: Insights from Passive Seismic Data.
21. Deep Structural Characterization of the Deccan Volcanic Province through High-Resolution Seismic Tomography.
22. High-Resolution Seismic Investigations of the Lonar Impact Crater
23. Understanding dynamic H_2 system with multi-source methane in chromitite-rich ultrabasic rocks
24. Enrichment of critical elements in ultrabasic rocks, sustainable technique element extraction
25. Sustainable environmental extraction of poor grade Au and Cu from mine overburden
26. Understanding enhanced rock weathering from source to sink
27. Tectonics of Andaman basin
28. Structural geology and tectonics of Giral Lignite Mine
29. Tectonics of Gandhar oil field
30. Tectonics of Raniganj coal field
31. Tectonics of Damagoria coal field, West Bengal
32. Structural geology and Tectonics of the abandoned Gandhar oil field
33. Tectonics of Cambay Basin
34. Facies characterization and stratigraphic analyses of the Tripura-Cachar Fold Belt
35. Paleozoic - Mesozoic transition in peninsular India: Insights from sedimentary basins of eastern India
36. Cretaceous foraminifera from Indian sedimentary basins
37. Foraminifera from the greater Mumbai coastline
38. 3D Numerical Modelling of Groundwater Flow in Porous and Fractured Aquifer Systems: Applications to Mining Environments.

39. Hydrological Modelling of Major Gondwana Coal Basins Using HEC-RAS, HEC-HMS, and SWAT-MODFLOW.
40. Hydrogen Energy Potential of Low- to Medium-Enthalpy Geothermal Resources alongside various Aquifer Systems.
41. Hydrogeology of Mineral Deposit Genesis and Environmental, Social, and Governance (ESG) Perspectives.
42. Water–Energy Nexus: Recovery of REEs and Critical Minerals from Mine Pool Water, Produced Water, Tailings, Pit Lakes, and Ash Dyke Reservoirs.
43. Hydrogeological Comparison of Ramsar Wetlands (Lonar & Kolleru) and Post-Mining Pit Lakes.
44. Quaternary ash beds of Deccan Uplands
45. Geological controls on coal mine methane recovery in a gassy coal mine in India

Category: Practical

46. Subsurface Mineral Prospectivity Mapping Using Attention-Based Convolutional Neural Networks: A Case Study from the Navatala-Devigarh REE block in NW India
47. Applicability and scalability of quantum sensing in CCS applications
48. Development of a Multi-Electrode Resistivity Meter System for Integrated DC Resistivity and Induced Polarization (IP) Measurements