

Table 2A: Departments and Allied Disciplines for Ph.D. Programmes.

Departments	Allied Disciplines
Department of Petroleum Engineering and Geosciences	<ul style="list-style-type: none">• Chemical Engineering• Mechanical Engineering• Electrical Engineering• Computer Science• Chemistry• Physics• Mathematics
Department of Chemical Engineering & Engineering Sciences	<ul style="list-style-type: none">• Civil Engineering• Electrical Engineering• Materials Science and Engineering• Petroleum Engineering• Chemistry• Physics• Mathematics• Chemical Technology
Department of Basic Sciences & Humanities	<ul style="list-style-type: none">• Material Science• Environmental Science• Biology• Chemical Engineering• Petroleum Engineering• Mechanical Engineering• Renewable Energy• Polymer Science• Nanoscience• Chemical Technology
Department of Management Studies	Any branch of Engineering, Science and Social Science
Energy Institute, Bengaluru	<ul style="list-style-type: none">• Chemical Engineering• Mechanical Engineering• Electrical & Electronics Engineering• Materials Science and Engineering

A candidate possessing degree(s) that do not exactly conform to the degree(s) listed above is also eligible to apply. Such application on recommendation from DPGC and approval from the Chairman Senate will be considered further for the shortlisting process.

Table 2B: Discipline-wise Research Areas for Ph.D. Programmes

The discipline-wise the Research Areas in the Ph.D. programmes for the Session 2021-22 are listed below.

Disciplines	Research Areas
Chemical Engineering	Biofuels, Biomass to Hydrogen, Heterogeneous catalysis, Catalytic isomerization, Process modeling, Design, Simulation and control, Design controllability interaction in integrated chemical systems, Corrosion failure, Corrosion inhibition, Phase transformations in polymers and soft matter, Interfacial rheology of oil-water interface, Process intensification, Microfluidics, Multiphase flow, Rare earth metal extraction, Computational modeling of catalytic processes, CO ₂ capture, Adsorption, Electrochemical systems, Flow battery, Water splitting, Photo catalysis, Polymer-ceramic composites.
Petroleum Engineering	Enhanced oil recovery, Nanodrilling fluids, Gas hydrates, Source rock evaluation, Mud formulation, Reservoir simulation, Flow assurance, Drilling fluids for shale formations, Petroleum geomechanics, Seismic data analysis, Unconventional hydrocarbon resources.
Civil Engineering	Structural Engineering, Hydraulics and Water Resources Engineering; Environmental Engineering; Geotechnical Engineering; Transportation Engineering, Geo-informatics; Engineering Geosciences, Remote Sensing
Electrical Engineering	Electrical machines & Drives; Power-Electronics; Control Systems; Power Systems
Electronics Engineering	Power electronics and machine learning applications to power system and drives, Distributed generation, Microgrid and smart grid technologies, Power quality, Microwave circuits, Microwave antennas.
Computer Science & Engineering	Applied cryptography, Information security, Post-quantum data protection, IoT security, Cyber security, Network/Communication protection, block chain and decentralized data privacy.
Humanities Sciences	English (Literature, Professional Communication, Cultural Studies, Film Studies, Narrative Studies), Philosophy (Indian and Western Logic, Peace and Ahimsa Studies, Gandhian Philosophy, Value Education, Humanistic Philosophy), Computational Linguistics, Psychology, Sociology (Environmental Sociology, Sustainable Urbanization, Smart Cities), History & Political Science.
Management Studies	Operations Management, SCM, Production System, Service Process Simulation and Service Level, Revenue Management and Analytics, Supply Chain Analytics, Contracts Modelling, Capacity Sensitive Product Mix Planning, Brand Management, Consumer Behaviour, Green Marketing, Services Marketing, Neuromarketing, Indigenous Management Systems, Human Resource Management, Strategic Issues in Oil & Gas Sector, Data Envelopment Analysis, Corporate Finance & Equity Valuation, Behavioural Finance, Initial Public Offerings, Marketing Management, Marketing

	Research, Consumer Behaviour, B2B Marketing, Sales & Distribution Management, Public Policy & Governance, Corporate Ethics, Governance and CSR, Entrepreneurship with reference to Rural/ Social Entrepreneurship, Strategic Management in Development Sector, Organizational Behaviour with reference to Government and Non- Government Sector. Marketing Management/Strategy, Product and Brand Management, Managing Retail Business, Conflict Management, Leadership, Energy related issues in Oil & Gas Sector.
Chemistry	Synthetic organic/inorganic chemistry, Environmental chemistry, Surface chemistry, Computational chemistry, Polymer chemistry, Materials chemistry, Nano catalysis, Metal organic frameworks, hydrogels, Petrochemicals, Biomaterials, Water splitting, Sustainable materials, Covalent organic frameworks, Physical chemistry.
Mathematical Sciences	Harmonic analysis, Differential geometry, Numerical wavelet methods for partial differential equations, Numerical analysis of (PDEs, Mathematical Image Processing, Stochastic Modelling, Integral equations, Numerical analysis, Optimization, Fluid dynamics, Biomechanics, Non-Linear waves, Graph theory and Network science, Rings and Modules, Mathematical modelling and Porous media, Soft computing, Fuzzy sets, Algebraic numerical techniques, Mathematical modelling.
Physics	Solar & space plasma physics, Condensed matter physics, Quantum information, Condensed matter physics & Materials science, Biophysics, Photonics, Remote sensing, High energy physics, Nuclear physics, Econophysics, Cosmology, Computational Materials Science, Ab-initio Calculations, Density Functional Theory, Electronic Structure of Materials, Flexible electronics, Wearable sensors, Photocatalysis, Nanomaterial.
Renewable Energy	Solar thermal systems, Phase change materials, Energy storage systems, Solar cell, Solar energy applications, Green buildings, sustainable development.
Materials Science & Technology	Polymers, Oxides, Nanoparticles for energy, Photo voltaics, Photocatalysis, Modelling & Simulation of material structures and processes
Geoscience	Isotope geochemistry, organic petrography, Hydrology and Watershed processes, Paleo environments and the sedimentary record, Biogeochemistry of soil systems, Coal petrology, Structural geology, Exploration seismology, Gravity and magnetic, Electromagnetics, Engineering geology.

Table 2C: Discipline-wise Research Areas for Ph.D. Programmes (Energy Institute, Bengaluru)

Disciplines	Research Areas
Electrical and Electronics Engineering	Power electronics, Control system, Electrical machines and drives, Smart grid and micro-grid, Electric vehicle, Hybrid electric vehicle, Renewable energy systems and integration, Solar photovoltaics, Building integrated Photovoltaic/Thermal systems, Energy efficiency, Net zero energy Buildings, Solar thermal systems, Energy, Exergy and economic analysis, Grid modernisation, Power quality, Energy and load forecasting, Life cycle

	assessment, Energy auditing, Battery management, Sensors and transducer, Smart energy systems, Instrumentation and process control, Data analytics, IoT, AI and Applications, Optimization
Mechanical Engineering	Fluid mechanics, Heat transfer, Computational fluid dynamics, Biofuels, Internal combustion engines, Gasification and system Integration, Thermal energy storage, Solar thermal systems, Phase change materials, Thermal management, Hydrogen storage and applications, Power plant engineering., Combined heat and power, Polygeneration and CO ₂ Capture.
Materials Science & Engineering	Solar cell, Nanomaterials and applications, Photocatalysts and electrocatalysts, condensed matter physics (experimental), Electronic materials, Fuel cell, Energy storage and conversion.

Table 2D: Total Number of Institute Assistantship available in the departments in Odd Semester 2021-22

Discipline	Total Number of Available Assistantship in PhD
Petroleum Engineering and Geosciences	09
Chemical Engineering & Engineering Sciences	10
Basic Sciences & Humanities	12
Management Studies	01
EIB Centre <ul style="list-style-type: none"> • Chemical Engineering • Mechanical Engineering • Electrical & Electronics Engineering • Material Science & Engineering 	02

NOTE:

- Reservation rules as per the Government of India policy will apply.
- The number of available Institute Assistantship should not be considered as available seats.
- Applicants who are either of sponsored category or who are already awarded fellowship by external agencies can submit their applications for admission in department even if there are no Institute Assistantship available.