

Table 1A: Departments and Qualifying Degrees for Ph.D. Programmes

Departments offering the Programme	Qualifying Degree (B. Tech./M. Tech./M.Sc.)
Chemical & Biochemical Engineering	<p>Bachelors or Master's Degree in Engineering/Technology in the following Disciplines:</p> <ul style="list-style-type: none"> • Chemical Engineering • Biochemical Engineering • Materials Science and Engineering • Metallurgical Engineering • Petroleum Engineering • Chemical Technology • Mechanical Engineering • Environmental Engineering • Renewable Energy Engineering • Biotechnology <p>or equivalent.</p> <p style="text-align: center;">Or</p> <p>Master's Degree in Science in the following Disciplines:</p> <ul style="list-style-type: none"> • Physics • Chemistry • Mathematics • Materials Science • Nanoscience, <p>or equivalent.</p>
Petroleum Engineering and Geoengineering	<p>Bachelor's or Master's Degree in Engineering/Technology in the following Disciplines:</p> <ul style="list-style-type: none"> • Petroleum Engineering • Chemical Engineering • Mechanical Engineering • Electrical Engineering • Computer Science & Engineering, <p>or equivalent</p> <p style="text-align: center;">Or</p> <p>Master's Degree in Science in the following Disciplines:</p> <ul style="list-style-type: none"> • Geophysics/Geology/Petroleum Geosciences • Chemistry • Physics • Mathematics, <p>or equivalent.</p>

Departments offering the Programme	Qualifying Degree (B. Tech./M. Tech./M.Sc.)
Computer Science and Engineering	<p>Bachelor's or Master's Degree in Engineering/Technology in the following Disciplines:</p> <ul style="list-style-type: none"> • Computer Science and Engineering • Information Technology • Information and Communication Technology • Mathematics and Computing • Electronics Engineering • Electrical Engineering • Petroleum Engineering • Energy Engineering, <p>or equivalent.</p> <p style="text-align: center;">Or</p> <p>Master's Degree in Science in the following Disciplines:</p> <ul style="list-style-type: none"> • Computer Science • Computer Applications • Electronics • Physics • Energy Sciences • Bioinformatics • Geoinformatics • Mathematics, <p>or equivalent.</p>
Electrical and Electronics Engineering	<p>Bachelor's or Master's Degree in Engineering/Technology in the following Disciplines:</p> <ul style="list-style-type: none"> • Electronics and Communication Engineering • Electronics Engineering • Electronics and Instrumentation Engineering • Electrical Engineering • Computer Science and Engineering • Energy Engineering <p>or equivalent.</p> <p style="text-align: center;">Or</p> <p>Master's Degree in Science in the following Disciplines:</p> <ul style="list-style-type: none"> • Applied Physics • Engineering Physics • Materials Science, <p>or equivalent.</p>

Departments offering the Programme	Qualifying Degree (B. Tech./M. Tech./M.Sc.)
Mechanical Engineering	<p>Bachelor's or Master's Degree in Engineering/Technology in the following Disciplines:</p> <ul style="list-style-type: none"> • Mechanical Engineering • Manufacturing Engineering / Production Engineering / Industrial Engineering • Materials Science and Engineering / Metallurgical Engineering • Aerospace Engineering / Automobile Engineering • Energy Engineering • Chemical Engineering • Petroleum Engineering • Electrical Engineering • Mechatronics Engineering <p>or equivalent.</p> <p style="text-align: center;">Or</p> <p>Master's Degree in Science in the following Disciplines:</p> <ul style="list-style-type: none"> • Physics • Applied Physics • Materials Science <p>or equivalent.</p>
Mathematical Sciences	<p>Master's degree (M.SC./M.A./M.S. or equivalent) in Mathematics, Applied Mathematics, Statistics, Mathematics and Statistics, Mathematics and Computing, Industrial Mathematics, Mathematics and Finance.</p> <p style="text-align: center;">Or</p> <p>Bachelor's or Master's degree in Engineering/Technology in the following Disciplines:</p> <ul style="list-style-type: none"> • Mathematics • Statistics/ Applied statistics / Biostatistics • Operations Research • Mathematics & Computing • Computer Science & Engineering, or equivalent.
Energy and Human Sciences	<p>Master's Degree in Science/Technology in the following Disciplines:</p> <ul style="list-style-type: none"> • Chemistry • Materials Science • Nanoscience & Nanotechnology • Polymer Sciences • Biochemistry/ Biotechnology/ Life Sciences • Physics • Applied/Engineering Physics • Electronics, or equivalent <p style="text-align: center;">Or</p>

Departments offering the Programme	Qualifying Degree (B. Tech./M. Tech./M.Sc.)
	<p>Bachelor's or Master's Degree in Engineering/Technology in the following Disciplines:</p> <ul style="list-style-type: none"> • Petroleum Engineering • Chemical Engineering • Mechanical Engineering • Materials Science & Engineering • Electrical Engineering • or equivalent <p style="text-align: center;">Or</p> <p>Master's Degree in Arts in Social Sciences and Humanities.</p>
Management Studies	<p>Master's degree in Management/Engineering/ Technology or equivalent.</p> <p style="text-align: center;">Or</p> <p>Master's degree in Science/Commerce/Arts or equivalent.</p> <p style="text-align: center;">Or</p> <p>Bachelor's degree in Engineering/Technology.</p> <p style="text-align: center;">Or</p> <p>Professional qualification- CA, ICWA & CS in addition to a bachelor's degree.</p>

NOTE:

Candidates holding degree(s) that do not exactly match those listed above may also apply. Such applications, upon recommendation by the DPGC and approval by the Chairman, Senate, shall be considered for further shortlisting.

Table 1B:**Department/Discipline-wise Research Areas for Ph.D. Programmes at RGIPT, Jais Campus**

Department	Research Areas
Chemical & Biochemical Engineering	Biofuels, Pyrolysis & Gasification of Biomass, 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, Metal extraction & Recycling, Computational modeling of catalytic processes, CO ₂ capture, utilization & sequestration (CCUS), Adsorption, Electrochemical systems, Flow battery, Water splitting, Polymer-ceramic composites. Polymers, Oxides, Nanoparticles for energy, Photo-Voltaic, Photocatalysis, Modelling & Simulation of material structures and processes, Renewable energy, Crystallization, Petroleum refining, Bioremediation and Biomaterial.
Petroleum Engineering and Geoengineering	Enhanced oil recovery, Drilling fluids, Gas hydrates, Source rock evaluation, Reservoir simulation, Flow assurance, Petroleum geomechanics, Unconventional hydrocarbon resources, Production operations, CO ₂ Sequestration, AI/ML applications, Rock Physics, Petrophysics and Geomechanics, Isotope geochemistry, organic petrography, Hydrology and Watershed processes, Paleo environments and the sedimentary record, Inorganic/ Organic, Coal petrology, Structural geology, Engineering geology, Ground water & hydrology, Exploration seismology, Gravity and Magnetic, Electromagnetics, Seismic data analysis, Rock Physics, Petrophysics, Geomechanics, Unconventional hydrocarbon resources, Source rock characterization, Reservoir Characterization & modeling, Formation Evaluation.
Computer Science and Engineering	Security and Privacy in IoV Networks: Blockchain, Cyber Security, Post Quantum Cryptography. Real-Time Scheduling System: Computational Geometry, Resource Scheduling in Cloud and Fog Computing Systems. Signal and Digital Image Processing: LiDAR: Laser Scanning, Laser Data Processing and Deriving Applications, Digital Image Processing, GIS and Data Science Approaches utilizing AI/ML. Graphics and Visual Computing: Salient Object Detection, Morphological Image Processing, Medical Image Processing. Cloud Computing, Fog Computing, Internet of Things, Message Synchronization, High-Performance Computing, Soft Computing, Virtualization, Edge Computing. Machine Learning and Artificial Intelligence: AI and ML applications, Multi-Sensor Data Analysis, AI for Deepfake Detection, Generative ML, AI in Reservoir Characterization, Computer Vision, Natural Language Processing. Microfluidic Lab on Chip and its algorithmic design, bio-protocol and sample preparation and its scheduling. Developing AR/VR applications for energy sector. Industrial process analysis with AI/ML & sensors. Natural Language Processing: Large Language Models (LLMs), Multimodal NLP, Low-resource and Multilingual NLP, Integrating knowledge and common sense, Contextualized modeling and multi-turn dialogue understanding, Explainable NLP, Ethics, Bias and Fairness, Conversational AI and Dialogue Systems, Few-shot and Zero-shot Learning

Electrical and Electronics Engineering	<p>Microelectronics/VLSI: Nano and Optoelectronics Devices, Solar Cells, Photodetectors, Organic FETs, Flexible Electronics, Wearable Electronics, Green Electronics and Sustainable Energy, Design Thinking, Energy harvesting, Simulation of Optical Devices, Experimental Study for optical Sensors, Metamaterial surfaces, VLSI architectures for signal and image processing, hardware accelerators for edge computing, approximate computing</p> <p>Communication & Signal Processing: Optical Communication, Wireless Communications (RF, 5G, 6G, Cognitive Radios), Signal Processing, Signal Processing for IOT Networks, IoT Systems for Energy & Healthcare, Optical Wireless Communications (VLC, FSO), Quantum Computing, Reconfigurable Intelligent Surfaces. AI-Enabled Wireless Communications for 5G/6G and Beyond: Intelligent resource allocation, channel estimation, signal detection, and optimization using AI/ML/DL. Visible Light Communication (VLC) and Li-Fi: Next-generation optical wireless communication for high-speed, energy-efficient, and secure connectivity. AI-Driven Massive MIMO: Deep learning-based channel estimation, CSI feedback and compression, beamforming, and spectral-efficiency enhancement. VLC for Smart Oil and Gas Infrastructure: Optical wireless communication for reliable connectivity, monitoring, and sensing in oil and gas pipelines and industrial environments. AI-Assisted Navigation for Visually Impaired People: Intelligent mobility guidance integrating VLC-based localization, obstacle detection, and multisensor navigation. Integrated Communication, Localization, and Sensing: Emerging technologies that combine wireless connectivity with positioning, environmental awareness, and intelligent decision-making. VLC-Based Indoor Localization and Positioning: High-accuracy indoor positioning using visible light, signal processing, and AI. Cognitive Radio and Intelligent Spectrum Sharing: AI-driven spectrum sensing, dynamic spectrum access, and secure wireless communication. UAV-Assisted and Intelligent Wireless Networks: AI-enabled communication, resource allocation, and reliable connectivity using unmanned aerial vehicles.</p> <p>Power & Control: Power Electronics & Drives, Electric Vehicle, Machine learning applications to the power system and drives, Distributed generation, Power System, Microgrid and smart grid technologies, Power quality, Electrical Machines & Drives; Control Systems, System Identification, Battery Management Systems, Wide-Bandgap (SiC/GaN) Power Converters: Modelling, Digital Twins, AI-Assisted Design and Grid Impacts, SiC Power Conversion for Green Hydrogen and Electrified Energy Industries, Power Electronics and Converter Control, Design of EV Battery Charger for Electric Vehicles, SiC/GaN-Based Converters and Their Control Design, Renewable Energy and Grid Integration.</p>
Mechanical Engineering	<p>Thermal and fluid sciences: Heat transfer, thermal management, microscale fluid dynamics, microfluidics, multiphase flow and droplet evaporation</p> <p>Energy and sustainability: Clean hydrogen, renewable energy, energy conversion and storage, thermochemical processes and waste valorization</p> <p>Pipeline and process engineering: Pipeline design, multiphase flow, thermo-fluid systems and fluid–particle interactions</p> <p>Advanced manufacturing and materials: Microfabrication, welding and joining, composites and materials characterization</p> <p>Intelligent manufacturing: AI/ML in manufacturing, process monitoring, non-destructive evaluation, and structural health monitoring</p>

	<p>Mechanical design and robotics: Design methodology, product design, wearable robotics, assistive robotics, soft robotics and human–robot interaction</p> <p>Computational modelling: Multiphysics modelling, CFD, numerical simulation, experimental validation and advanced control</p> <p>Microfluidics and biomedical technologies: Electrohydrodynamics, biomedical devices, bio-fluid mechanics and point-of-care diagnostics</p>
Mathematical Sciences	Reliability theory, Statistical Information theory, Stochastic ordering and ageing, Order statistics and Record values. Numerical analysis of partial differential equations, Control theory, Hyperbolic conservation laws, Computational fluid dynamics, Data assimilation techniques, Integral Equations, Time Scale Theory, Dynamical System, Mesh free Methods, Computational Finance, Functional Analysis, Spectral Theory, Algebraic Geometry, Complex Geometry, Number Theory, Elliptic Curves, Approximation Theory, Numerical Analysis of Operator Equations, Partial Integro-Differential Equations, Option Pricing, Calibration and Inverse Problems, Periodicity and Stability of Stochastic Systems, Physics-Informed Neural Networks and Scientific Machine Learning, Data-Driven Modeling.
Energy and Human Sciences	<p>Chemistry:</p> <p>Materials Development (Organic Synthesis/Polymer synthesis/Photo catalysis/ Electro catalysis/Nano Catalysis/H₂ production/CO₂ utilization/ Hydrogel/ MOF/ COF/ Nanocrystal/ Petrochemical), Biotechnology/ Microbiology</p> <p>Physics:</p> <p>Condensed Matter Physics and Materials Science, Magnetic and Multiferroic Materials, Soft Sensors and Actuators, Phase-Change Materials, Energy Storage Materials.</p> <p>Humanities: English (Literature, Cultural studies, Film studies, Professional Communication, Narrative Studies etc.)</p>

Table 1C:

Department/Discipline-wise Research Areas for Ph.D. Programmes at RGIPT, Bengaluru Campus

Disciplines	Research Areas
Electrical and Electronics Engineering	Power electronics, Control system, Electrical machines and drives, Smart grid and micro-grid, Electric/Hybrid/Fuel Cell based Vehicle system, Renewable energy systems and integration, Solar photovoltaics, Building integrated Photovoltaic/Thermal systems, Energy efficiency, Net zero energy Buildings, Solar PV/T and Concentrator based system, Energy, Exergy and economic analysis, Grid modernisation, Power quality, Energy and load forecasting, Life cycle assessment, Energy auditing, Battery Management System/Thermal Management System, Sensors and transducer, Smart energy systems, Instrumentation and process control, Data analytics, IoT, AI and Applications, Optimization, Novel Materials for Sensor Applications, Wearable Devices, Safety and Occupational hazards management, Smart sensor applications in Energy Sector, Automotive Safety, Piezoelectric-based energy harvesting, AI enabled energy management, Digital twin, Green Hydrogen Production and Integrated Energy–Water–Hydrogen Systems, Hardware-in-the-Loop (HIL) Simulation and Intelligent Control of Energy Systems.

Mechanical Engineering	Energy Storage, Energy and Buildings, Phase change materials, Fluid-Thermal Engineering, Computational Fluid Dynamics, Power Plant Engineering, Data Center Thermal Management and Cooling Technologies, Thermal Management of Batteries, Buildings, and Electronic Processors, Solar Thermal Energy Systems and Renewable Energy Technologies, AI/ML-Driven Modelling, Simulation, and Optimization of Energy Systems.
Computer Science and Engineering	Machine Learning, Artificial Intelligence, IoT, Computer Vision, Pattern Recognition Natural Language Processing and Multimodal Deep Learning.
Management Studies	<p>Energy: Energy Transition, Clean Energy Adoption, Hydrogen Adoption, Sustainability, Energy Policy, Environmental, Social and Governance (ESG), Sustainable Energy Finance, Energy Economics, Renewable Energy Adoption, Hydrogen Economy, and Quantitative Research Methods (SEM, ANN and Statistical Modelling).</p> <p>Finance: Corporate Finance and Equity Valuation, Initial Public Offerings, Behavioural Finance, Blockchain in Financial Services or Fintech, Stock Price Volatility, Sustainable Finance and Government Policy, Behavioural Finance, Corporate Finance, Sustainable and Green Finance, ESG Investing, Financial Markets, FinTech, Investor Behaviour, Financial Literacy, AI/ML Applications in Finance, Energy Finance.</p> <p>OB & HR: Human Resource Management, Indigenous Management Systems, Organizational Behaviour, Leadership, Corporate Ethics, Governance and CSR, Negotiations and Conflict Management.</p> <p>Business Analytics & Information Systems: Big Data Analytics, Supply Chain Analytics, Data Mining, Natural Language Processing, Data Science, Artificial Intelligence and Machine Learning, Organisational Information Systems, E-Commerce and M-Commerce, Social Media Analytics, Sales Management, Consumer Behaviour, Business-to-Business Marketing (B2B).</p> <p>Marketing: Product and Brand Management, Consumer Behaviour, Neuromarketing, Digital and Social Media Marketing, Green Marketing, Services Marketing, B2B Marketing, Retailing, Sales and Distribution Management, Digital Transformation in Marketing, Consumer Acceptance of Emerging Technologies, Adoption of Artificial Intelligence in Sales & Marketing.</p> <p>Operations: Operations Management, Supply Chain Management, Production System, Service Process Simulation and Service Level, Revenue Management and Analytics, Contracts Modelling, Capacity Sensitive Product Mix Planning, Supply Chain Analytics, Multi-sourcing, Returns Management, Revenue Management and Analytics, Deep learning in the supply chain, ML in circular economy.</p> <p>Economics: Financial Economics, Corporate Governance in Banks, Commercial Banking, Efficiency and Productivity Analysis, Technology Adoption in Banks.</p> <p>Digitalization, Sustainable Supply Chain Management, Supplier Selection, Service Operations Management, Agri-food Supply Chain, Circular Supply Chain, Manufacturing Supply Chain, Warehouse Management, Logistics Management, Supply Chain Analytics, Energy Economics, Environmental Economics, Financial Economics, Macroeconomics, Econometrics, Machine learning in business, Text analytics (Natural Language Processing) in business, Deep learning in business, Big-data analytics in business, Information Systems and Technology, Human-computer interaction.</p>

Mathematics and Computing	Copulas, Dependence Modelling, Multivariate Statistical Analysis, Statistical Information Theory, Reliability and Survival Analysis, Statistical Decision Theory, Statistical Inference, Probability and Statistics, Statistical Machine Learning
Chemical Engineering	Electrocatalytic CO₂ Reduction (ECR): Designing non-noble, earth-abundant metallic nano electrocatalyst for the selective ECR to high-value products such as CO, HCOOH, and ethanol. Multiphysics Simulation: Coupling experimental electrochemistry with COMSOL Multiphysics to model complex mass transport, fluid dynamics, and reaction kinetics. Metal Recovery: Investigating green methodologies, utilizing Deep Eutectic Solvents (DES), for the selective extraction and electrochemical recovery of critical metals (Li, Co) from spent lithium-ion batteries.
Social Sciences	Sociology (Sociology of Development, Migration and Diaspora Studies, Sociology of Education)

Table 1D:

Department/Discipline-wise Research Areas for Ph.D. Programmes at RGIPT, Sivasagar Campus

Disciplines	Research Areas
Chemical Engineering	Renewable Energy, Experimental and Computational Fluid Dynamics, Microfluidics, Complex Fluids; Thermochemical Characterization and Conversion of Biomass and Waste Plastics; Pyrolysis and Co-Pyrolysis; Kinetic and Thermodynamic Studies; Waste-to-Energy and Resource Recovery; Microbial Fuel Cells; and Sustainable Wastewater Treatment; Nano structured material for Environmental and Energy Applications, Environmental remediation, Electrochemical sensors, Emerging Pollutants
Petroleum Engineering	Surface Production, Offshore Oil & Gas, Oil & gas market, business and development; Microfluidics and Pore-scale Flow, Drilling Fluids and Rheology, Computational Fluid Dynamics (CFD), Geothermal Energy and Geothermal Well Engineering, HPHT Drilling Challenges, Advanced Drilling Fluid Systems for HPHT and Geothermal Applications; Carbon Capture, Utilization and Storage (CCUS), Enhanced Oil Recovery (EOR), Computational Fluid Dynamics (CFD) for Petroleum Engineering, Subsurface CO ₂ and H ₂ Storage, Artificial Intelligence and Machine Learning in Oil & Gas, Quantum Computing and Quantum Algorithms for Engineering Applications, IC Engine, Biodiesel, CCUS policy, Strategic Petroleum Reserves Policy, Oil Well Drilling and Cementing
Electrical & Electronics Engineering	Fractional Order PID Controllers, Smart Grid, Evolutionary Optimization Techniques; RF and Microwave Antennas and Filters, Microwave Devices, Filtering Antennas; Power Electronics, Renewable Energy Systems and Process Control, Micro grid and smart grid technology, Electric Vehicles; Semiconductor Devices, Sensors, MEMS, NEMS, Controller Design, Controller Optimization, Emerging solar cell technology, Electronic materials and its applications in sensing, water splitting and energy storage technologies.

Fire and Safety Engineering	Modelling and simulation in Pool and Jet fires; Combustion and Explosion analysis in storage vessels/pipelines; Industrial Fires; Modelling in Enclosure Fire, Modelling in Process Safety and Risk Assessment, Industrial Fire Safety and Hazard Mitigation (i.e. Chemical and Petroleum Industries), Quantitative Fire Risk Assessment and Management Strategies
Chemistry	Nanoscience, Molecular sensing, Energy Application; Functional coating and thin films for: <ul style="list-style-type: none"> • Water purification • Gas Separation • Energy storage.
Mathematics	Mathematical Modeling and Applications, Mathematical Ecology, Nonlinear Fuzzy Set Theory and its Extensions, Uncertainty Modelling, Hesitant Fuzzy Sets, Fuzzy Measures, Decision Making (MCDM), Statistical Machine Learning, Statistical Inference under Degradation Data, Reliability and Survival Analysis, Life Testing Analysis under Censored Data
Physics	Theoretical Condensed Matter Physics: Magnetism, Superconductivity, Twisted Bilayer Graphene, Computational Soft Matter Physics, Complex systems like Liquid crystals, ionic liquids, Classical density functional theory, Supercritical fluids
Mechanical Engineering	Thermal and Fluid, IC Engines, Alternative Energy sources, Molecular simulation of phase transition; Theoretical studies on heterogeneous nucleation, Pipeline design for multiphase flow (Experimental & Simulation), Deployable furniture design, Thermo-fluid, Powder and granules rheology, Polymer composites; Additive Manufacturing, Sustainable Materials, Mechanical testing and characterisations, 3D printing; Material Characterizations; Flame retardant polymer materials, Nonequilibrium Thermodynamics, Thermodynamics of Irreversible Processes, Biofuels, Engines and Exergy Analysis, Hydrogen Application, Renewable Energy, Thermal Management, Statistical Analysis, Artificial Neural Network, AI/ML in Manufacturing and Materials Processing, Deformation Behaviour and Formability, Microforming of high performance alloy and composites, Sustainable recycling, Equipment and Tool design, Severe Plastic Deformation, Micromachining, Multi-scale machining process, Finite element modeling (FEM), Machinability and materials characterization, Surface engineering
Materials Science & Engineering	Solar cells, Nanomaterials and applications, Photocatalysts and electrocatalysts, condensed matter physics (experimental), Electronic materials, Fuel cell, Energy storage and conversion devices and computational material science

Table 1E:

Department Wise Number of Institute Assistantship Available in Even Semester 2026-27 Along with Specific Research Area

Department/Discipline	Specific research area	Available PhD seats with Institute Assistantship
RGIPT Jais Campus		
Chemical & Biochemical Engineering	<ul style="list-style-type: none"> • CO₂ capture and Conversion • Heterogeneous catalysis for hydrogen generation and storage; Bioremediation and Biomaterial • Fabrication of hydrogen production device - performance analysis • Corrosion • Transition metal-based composites for electrochemical applications 	05
Petroleum Engineering and Geoengineering	<ul style="list-style-type: none"> • Enhanced Oil Recovery (EOR); Cementation; CCUS; Gas Hydrates; CO₂ Utilization • Design of high-density brine drilling fluids for HP/HT environments; Formulation of nanoparticle-assisted polymer slugs for Carbon Dioxide utilization and sequestration • Flow Assurance: Flow Improvement of Crude Oils; CCUS: CO₂ Utilisation in EOR and Sequestration in Reservoirs; Drilling and Production Process Optimization; Novel EOR Techniques and Optimization • Enhanced Oil Recovery; Reservoir Modelling and Simulation; AI/ML in Upstream Oil Industry; Carbon Utilization and Sequestration 	04
	<ul style="list-style-type: none"> • Petroleum Geology, Hydrocarbon Source-Rock Evaluation and Basin Analysis; Unconventional Hydrocarbon Resources and Reservoir Characterization, Including Coalbed Methane and Shale Gas; Geological CO₂ Sequestration and Enhanced Coalbed Methane Recovery; Rare Earth Elements and Critical Mineral Recovery from Coal-Associated Resources; Coal Petrology, Coal Chemistry, Organic Geochemistry and Sustainable Resource Utilization; Sedimentary Basin Analysis, Basin Evolution and Paleoenvironmental Reconstruction • Exploration Geophysics; Near Surface Geophysics 	02

Computer Science & Engineering	Cyber Security and malware analysis using AI-driven techniques, Large Language Models (LLMs), Multimodal NLP, Low-resource and Multilingual NLP, Intelligent transportation systems, Deep learning techniques for spatiotemporal data modeling for domains like traffic, climate, agriculture, pandemics, etc.	03
Electrical and Electronics Engineering	<ul style="list-style-type: none"> • Wide-Bandgap (SiC/GaN) Power Converters: Modelling, Digital Twins, AI-Assisted Design and Grid Impacts, SiC Power Conversion for Green Hydrogen and Electrified Energy Industries • Areas of wireless communication and AI-enabled wireless communication, intelligent wireless technologies for 5G/6G and beyond, AI-Enabled Wireless Communications for 5G/6G and Beyond, Visible Light Communication (VLC) and Li-Fi, AI-Driven Massive MIMO, VLC for Smart Oil and Gas Infrastructure, AI-Assisted Navigation for Visually Impaired People. • Power Electronics and Converter Control, Design of EV Battery Charger for Electric Vehicles, SiC/GaN-Based Converters and Their Control Design, Renewable Energy and Grid Integration. • VLSI architecture for signal and image processing, hardware accelerators for edge computing, approximate computing 	04
Mechanical Engineering	<ul style="list-style-type: none"> • Mechanical design and tribological analysis • Thermal energy storage and Carbon Capture, Utilization, and Storage (CCUS) • Friction stir-based additive manufacturing for composite structures and thermomechanical analysis • Microfluidics, Electrohydrodynamic jetting and its application in flexible electronics, sensor fabrication. • Sustainable Bioenergy and Waste-to-Energy Technologies: Biogas, Biohydrogen, and Resource Recovery • Design and Analysis of Thermochemical Reactor for Sustainable Aviation Fuel Synthesis, Development of Hydrogen Compressor and Purification Pilot Plant • Design, Ergonomic Optimization, and Human-Factors Evaluation of an Industrial Neck-Assist Wearable Robot for Overhead Tasks 	07
Mathematical Sciences	<ul style="list-style-type: none"> • Computational Finance, Numerical Analysis and Differential Equations, Numerical Methods for PDEs and Partial Integro-Differential Equations, Physics-Informed Neural Networks and Scientific 	05

	Machine Learning, Option Pricing, Calibration and Inverse Problems, Data-Driven Modeling <ul style="list-style-type: none"> • Approximation Theory, Numerical Analysis of Operator Equations • Elliptic Curves, Number Theory, Algebraic and Complex Geometry • Time-Scale Dynamic Equations, Periodicity and Stability of Stochastic Systems, Physics-Informed Scientific Machine Learning for Mathematical Modeling • Reliability Theory, Statistical Information Theory 	
Energy & Human Sciences	<ul style="list-style-type: none"> • Porous Materials, Heterogeneous Catalysis, Electrocatalysis, Solar Thermal Energy Storage • Systems, Multiferroic and Magnetoelectric Materials for data storage device, Solar Energy Materials and Devices, Soft Sensors and Actuators, Flexible Optoelectronic Devices, biomass conversion, Plastic recycling 	05
RGIPT Bengaluru Campus		
Robotics and Automation	Solar Photovoltaic and Photovoltaic/Thermal (PV/T) Systems; Building-Integrated Photovoltaics (BIPV/BIPVT); Smart Grids and Hybrid Renewable Energy Microgrids; AI-Enabled Energy Management and Digital Twin Technologies; Green Hydrogen Production and Integrated Energy–Water–Hydrogen Systems; Electric Vehicles, Battery Energy Storage and Thermal Management; Hardware-in-the-Loop (HIL) Simulation and Intelligent Control of Energy Systems	01
Electrical and Electronics Engineering	Instrumentation and control, Gas Sensors, Novel Materials for Sensor Applications, Wearable Devices, Safety and Occupational hazards management, Smart sensor applications in Energy Sector, Automotive Safety, Piezoelectric-based energy harvesting, Solar PV reliability modelling, Electric Vehicle Energy Management, Control, Energy Efficiency and Optimisation, Smart Grid Analytics and Technologies, Micro-Grid, AI applications in Energy systems	02
Computer Science and Engineering	Artificial Intelligence, Multimodal Deep Learning and Computer Vision	01
Mathematics and Computing	Probability and Statistics, Copulas, Dependence Modelling, Multivariate Statistical Analysis, Statistical Information Theory, Reliability and Survival Analysis, Statistical Decision Theory, Statistical Inference, Statistical Machine Learning	02
Chemical Engineering	Electrocatalytic CO ₂ Reduction (ECR): Designing non-noble, earth-abundant metallic nano electrocatalyst for the selective ECR to high-value	01

	products such as CO, HCOOH, and ethanol. Multiphysics Simulation: Coupling experimental electrochemistry with COMSOL Multiphysics to model complex mass transport, fluid dynamics, and reaction kinetics. Metal Recovery: Investigating green methodologies, utilizing Deep Eutectic Solvents (DES), for the selective extraction and electrochemical recovery of critical metals (Li, Co) from spent lithium-ion batteries	
Management Studies	Energy, Marketing, Retailing, Consumer Behavior, Green Marketing, Services Marketing, Neuromarketing, Retail Management, Sales Management, Consumer Behaviour, Business-to-Business Marketing (B2B), Digital Transformation in Marketing, Consumer Acceptance of Emerging Technologies, Adoption of Artificial Intelligence in Sales & Marketing, Supply Chain Analytics, Multi-sourcing, Returns Management, Revenue Management and Analytics, Deep learning in the supply chain, ML in circular economy, Machine learning in business, Text analytics (Natural Language Processing) in business, Deep learning in business, Big-data analytics in business, Information Systems and Technology, Human-computer interaction, Digitalization, Sustainable Supply Chain Management, Supplier Selection, Service Operations Management, Agri-food Supply Chain, Circular Supply Chain, Manufacturing Supply Chain, Warehouse Management, Logistics Management, Supply Chain Analytics, Energy Economics, Environmental Economics, Financial Economics, Macroeconomics, Econometrics	07

RGIPT Sivasagar Campus		
Chemical Engineering	<ul style="list-style-type: none"> • Renewable energy • Experimental Fluid Dynamics • Microfluidics • Biofuels • Pyrolysis and Co-Pyrolysis • Waste-to-Energy • Microbial Fuel Cells • Sustainable Wastewater Treatment • Nano structured material for Environmental and Energy Applications • Electrochemical sensors • Emerging Pollutants • Fire Dynamics • Combustion • Computational Fluid Dynamics in Fire Dynamics • Explosion and Industrial Fire Safety 	04

	<ul style="list-style-type: none"> • Industrial Safety and Risk Assessment • Modelling in Enclosure Fire • Industrial Safety and Hazard Management Occupational Health and Environment Structure Modelling in Fire 	
Electrical & Electronics Engineering	<ul style="list-style-type: none"> • Fractional Order PID Controllers, • Smart Grid, Evolutionary Optimization Techniques • RF and Microwave Antennas and Filters • Microwave Devices • Filtering Antennas • Power Electronics, • Renewable Energy Systems and Process Control • Micro grid and smart grid technology • Electric Vehicles • Semiconductor Devices • Sensors • MEMS • NEMS • Controller Design and Optimization 	04
Petroleum Engineering	<ul style="list-style-type: none"> • Carbon Capture, Utilization and Storage (CCUS) • Enhanced Oil Recovery (EOR) • Computational Fluid Dynamics (CFD) for Petroleum Engineering • Subsurface CO₂ and H₂ Storage • Artificial Intelligence and Machine Learning in Oil & Gas • Quantum Computing and Quantum Algorithms for Engineering Applications • Microfluidics and Pore-scale Flow • Drilling Fluids and Rheology • Geothermal Energy and Geothermal Well Engineering • HPHT Drilling Challenges • Advanced Drilling Fluid Systems for HPHT and Geothermal Applications • Surface Production • Offshore Oil & Gas • Oil & gas market, business and development • Internal Combustion Engine • Biofuels • Oil Well Drilling and Cementing • Carbon Capture Utilization and Storage Policy • Strategic Petroleum Reserves Policy 	04

Mechanical Engineering	<ul style="list-style-type: none"> • IC Engines • Heat Transfer • Biofuels • Hydrogen applications • Fluid flow analysis • Composite materials • Biocomposites • Additive Manufacturing • Equipment and Tool Design • Severe plastic deformation • Micromachining • FEM • Machinability • Multi-scale machining process • Advanced manufacturing techniques • Finite element modeling • Sustainable recycling • Equipment and Tool Design 	04
Engineering Sciences	<ul style="list-style-type: none"> • Computational Soft Matter Physics, Complex systems like Liquid crystals, ionic liquids, Classical density functional theory, Supercritical fluids • Theoretical Condensed Matter Physics: Magnetism, Superconductivity, Twisted Bilayer Graphene • Nanoscience, Molecular sensing, Energy Application • Functional coating and thin films for Water purification, Gas Separation, Energy storage • Mathematical Modeling and Applications, Mathematical Ecology, Nonlinear Fuzzy Set Theory and its Extensions • Uncertainty Modelling, Hesitant Fuzzy Sets, Fuzzy Measures, Decision Making (MCDM) • Statistical Machine Learning, Statistical Inference under Degradation Data, Reliability and Survival Analysis, Life Testing Analysis under Censored Data 	07
Project-linked PhD category (Jais Campus Only)		
Petroleum Engineering and Geoengineering	Development of high return biogas slurry processing system for CO ₂ absorption, energy and fertilizer	01
Mechanical Engineering	Sustainable plastic waste recycling technologies for high value product manufacturing	01
Energy and Human Sciences	Production, Upgradation and Sustainability assessment of Bio crude production from Hydrothermal Liquefaction of Lignocellulosic Biomass	01

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/external/part time category or who are already awarded fellowship by external agencies can submit their applications for admission in department/campuses even if there are no Institute Assistantship available.**
- **Ph.D. students registered at the Bengaluru and Sivasagar campuses shall be awarded their Ph.D. degrees by RGIPT. They may complete their prescribed coursework at their respective campuses or at the RGIPT Jais campus, as applicable and subject to the Institute's academic regulations.**
- *The Dean (Academic Affairs) may waive the coursework credit requirements for Ph.D. candidates, upon the recommendation of the DPGC, subject to the following eligibility criteria:*
 - i) ***External/Part Time Category:*** *Candidates holding an M.Tech. degree from a Centrally Funded Institution (CFI/CFTI) as the qualifying degree.*
 - ii) ***Part Time Category:*** *Candidates holding an M.Tech. degree with a CPI of 7.0 or above in the qualifying degree and having at least **five years of relevant professional experience in industry.***
 - iii) ***Part Time Category:*** *Candidates holding a B.Tech. degree with a CPI of 7.5 or above in the qualifying degree and having at least **ten years of relevant professional experience in industry.***
 - iv) ***External Registration Category:*** *Candidates holding a master's degree from a reputed Government institute/university as the qualifying degree and having at least **five years of relevant experience in industry and/or academia.***