Areas of Research for Doctor of Philosophy (July 2025 Admissions)

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
Computer Science and Engineering	Computer Science and Engineering	Artificial Intelligence, Interpretability of AI and ML Models, Online Learning, Explainable AI, Deep Learning, Evolving and Adaptive Intelligent Systems, Data Mining, NLP, Speech Processing, Computer Vision, Nature-inspired Algorithms, Intelligent and Networked Robotics, Augmented/Virtual Reality, Human-Computer Interaction, Distributed Systems, Edge and Cloud Computing, Wireless Networks, Software Defined Networking, IoT, Smart Grid, Intelligent Transportation Systems, Autonomous Vehicles, Network Security, ML for Security, Hardware Security, Controller Synthesis and Games, Formal Verification, Logic in Computer Science, High-level Synthesis, Electronic Design Automation (EDA), ML for EDA, Hardware Acceleration, Embedded and Cyber-Physical Systems, System-on-chip validation, Multicore Architecture, Memory Systems, Nearmemory Computing, Disaggregated Compute Systems, Approximate Computing, Data Structures, Algorithms, Distributed Algorithms, Randomization and Approximation Algorithms, Optimization, Computational Geometry.	CSE Department
Electronics and Electrical Engineering	Communication Engineering	Wireless Communications; Information Theory and Coding; Communication Networks; Quantum error correction; Quantum computation and communication; Waveform design for wireless communications; Vehicular communications; 5G/6G Wireless communication: Massive MIMO, Cell-Free Massive MIMO, Orthogonal Time Frequency Space (OTFS) Modulation, Intelligent Reflecting Surfaces (IRS), Integrated Sensing and Communications (ISAC), Rate Splitting Multiple Access (RSMA); AI/ML application in communications; Adversarial machine learning; Blockchains and Cryptocurrency Technologies; Generative AI for Physical Layer Communications	EEE Department
	Power Engineering	Power Systems; Power Electronics; Power Quality; Power electronics application in power system; Micro grid and renewable energy resources; Power distribution system planning; Custom power devices; Electrical Machines; Control of Electrical	

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		Drives; Smart Grids and Electric Vehicles; High Voltage Engineering; High Voltage Engineering and Applied Electromagnetics; Condition Monitoring of Power Apparatuses; High voltage and Pulse power; High power density motor design; Inductive charging for EVs; Vector Control of Motors; Power system Monitoring and Control; Power System Cyber-Security; Decentralized Control for the Smart Grid, Fuel Cell-Battery hybrid energy systems.	
	Microelectronics; Photonics and RF Engineering	Microelectronics; Solid-State Devices; Semiconductor Devices; Optical devices; Fiber Optic Communication; Optoelectronics; Photonics Integrated Circuits; Silicon photonics; Optical Communication; Optical Networks; Optical Sensors; Nanophotonics; Biophotonics; Photonic Computing; Lidar; AI/ML-Assisted Photonic Design; Distributed Acoustic Sensors; Microwave and Photonics; Quantum Photonics; Optical Instrumentation; Programmable Photonics; Plasmonics and metamaterials and smart electrotuneable plasmonic metasystems; Structural Health Monitoring Using fiber Optics; Optical Signal Processing; Digital Holography; Phase Imaging; Laser Speckle Imaging, Fringe Projection Profilometry, Interferometry; Photonics and Metamaterial device design using AI; Metamaterials for MRI; Antenna; Microwave Engineering; Electromagnetics; Computational Electromagnetics. Reconfigurable Metasurfaces; TeraHertz Photonic Topological Insulators; Metamaterials and Metasurfaces for Advanced photovoltaics and Light emitting diodes; Antenna; Microwave Engineering; Electromagnetics; Computational Electromagnetics; Vacuum Electronics; Millimeter-wave Communication.	
	Signal Processing and Machine Learning	Data Sciences; Biomedical Signal and Medical Image Processing; Speech and Handwriting Processing; Image/Video Processing and Computer Vision; Pattern Recognition; Multimedia Analytics; Biometrics; Counter-spoofing; Security and Privacy; Biometrics and Biometric counter-spoofing; Privacy preserving analysis for secure computation; Secure key distribution and management in wireless sensor	

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		networks; Video Analytics; Vision and Language; Natural Language Processing; Deep Learning.	
	Systems; Control and Automation	Systems Theory; Control Theory and Applications; Control of Nonlinear Uncertain Systems; Artificial Intelligence based Control; Identification and Control of Nonlinear Systems; Relay Based Identification and Autotuning; Adaptive Control; Optimal Control; Robotics and Automation; Cryptography; Robust Control; Cooperative Control of Multi-agent Systems; Decentralized Control for Smart Power Grid Applications; Model Predictive Control; Reinforcement Learning; Vibration control of flexible structures; Modelling and control of mechatronic and robotic systems; Multi-agent systems and Cooperative control; Group-coordinated control of UAVs; UGVs and AUVs; Connected Vehicle Platooning; Passivity-based control and Dissipativity; Negative-imaginary systems theory; Robust control of missiles; spacecraft and rockets; Smart and Microgrid control using a multi-agent framework; Controller Design for Energy Management System in Electric Vehicles.	
	VLSI and Nanoelectronics	Solid-State Devices; Analog and RF Integrated Circuits; Digital Systems; DSP Architectures; CAD for VLSI; High Performance Computing; MEMS; Organic Electronics; Flexible Electronics; Instrumentation; Quantum Computing; Hardware Security; Sensors; Non-volatile memory technologies; Spintronics; Power Semiconductor Devices; Photodetectors; VLSI System Design; Embedded System Design; Computer Architecture; Neuromorphic Computing; In-Memory Computing; Hardware Realization of Machine Learning Algorithms; Magnetic random-access memory (MRAM); Magnetic Tunnel Junctions (MTJ); Advanced data storage technologies; Neuromorphic devices; ; Wearable Sensors; Electronic Nose; Papertronic Sensing Systems; and Sensor Interface Electronics; Quantum Photonics; Wide Bandgap semiconductors; Reliability; Photovoltaics; Energy Devices for Green Hydrogen; SAW Devices; Quantum Sensing Devices; Semiconductor Packaging Technologies; Low-Dimensional Semiconductor	

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		Devices; Single Electron Transistors; Single Photon Emitters and Detectors; Nano-Bioelectronics; Light Emitting Diodes and Transistors; Transient Electronics.	
Mechanical Engineering	Machine Design	Machine Design; Vibrations; Solid Mechanics; Data-driven material modelling; Modelling of heterogenous materials; Rehabilitation Robotics; Robotic Neurorehabilitation; Quantum Computing in Computational Mechanics; Multi-Disciplinary Design and Optimization; Operations Research; Multiscale Modelling of Composites; Micromechanics and Homogenization; Application of Machine Learning in Material Modelling; Rotor Dynamics; Condition Monitoring of Machinery; Polymer Composites; Natural Fiber Reinforced Composites; Predictive Maintenance; Generative Design; Digital Twin in Machine Design; Electromagnetics; Functionally Graded Material Fabrication; FEM in Acoustics, Electromagnetics and Structures; Optimization, Structural Optimization; Biomedical Devices, Assistive Devices, Rehabilitation Engineering, Biodesign; Fatigue Fracture in Metals, Polymers, and Composites; Solid State Battery Modelling and Analysis, PZT Actuator and Sensor Fabrication, Bamboo Composites	ME Department
	Manufacturing and Materials	Manufacturing Engineering; Metal Additive Manufacturing Technologies; CAD /CAM; Mechanical metamaterials; Impact energy absorbing materials; Metallurgy of 3D-printing; Natural Fiber Reinforced Composites; Polymer Composites; Repairing of underwater structures using composites; AI and ML in Machining Processes; Modelling of Manufacturing Processes; Digital twin in manufacturing; Composite Machining; Additive Manufacturing; Electromagnetic Forming; Electromagnetic Crimping; Dynamics in machining processes; Welding; Micromachining and micromanufacturing; Sustainable material design; Laser based manufacturing processes; Automation in manufacturing, Advanced Machining Processes.	
	Fluids and Thermal	Droplet-based microfluidics, Microscale PIV analysis of single/multi component flows, Flow through plants, Analysis of flow-induced stress on plant roots, Experimental investigation of flow-induced vibrations and its application in	

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		renewable energy, Development of in-house flow measurement devices such as PIV and LDA, Development of a microfluidic device for sustained drug release in cancer theranostics, Formation and manipulation of ferrofluid droplets by external field, Numerical investigation of flow-induced vibrations, Development of fluid-structure interaction solver based on spectral-element method, Supercritical heat transport system, Multiphase flow simulation using Lattice Boltzmann method, Investigation of MHD turbulence via Direct Numerical Simulations (DNS) and Large Eddy Simulations (LES), Investigation of explosive instabilities in tokamak plasmas relevant to fusion energy generation; Effect of Water and Light on Health: affordable healthy drinking water, Ordered Water and its Disease-curing Capacity, Biomimetic Extreme-wetting Surfaces and Their Applications from Energy to Health.	
Civil Engineering	Environment Engineering	(For Civil Engineering Department, Sub-Area is not required to be filled in the application form)	Civil Engineering Department
	Geotechnical Engineering		
	Infrastructure Engineering & Management		
	Structural Engineering		
	Transportation Engineering		
	Water Resources and Hydraulic Engineering		
	Earth System Science and Engineering.		

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
Biosciences and Bioengineering	Biosciences and Bioengineering	All Areas of Biosciences and Bioengineering.	BSBE Department
Chemical Engineering	Chemical Engineering	Materials Science and Engineering; Colloid and Interface Science; Catalysis, Photocatalysis & Electrocatalysis; Process Intensification; Microfluidics and Optofluidics; Energy Science and Technology; Green Hydrogen; Biological Physics; Bioengineering; Biomass Pyrolysis; Lignocellulosic Biomass and Microalgae Biorefinery; Artificial Intelligence/Machine Learning/Data Science; Micro/Nano Science and Engineering; Environmental Science and Engineering; Petroleum Science and Engineering; Petrochemicals; Petroleum Refinery; Process Control; Multiphase flow; Advanced Computing (Molecular dynamics, Multiscale simulations, CFD, Optimization); Computational Bioscience; Quantum Chemistry; Food Science and Technology; Polymer Science and Technology; Fluid-structure interaction; Droplet/particle dynamics; Carbon Capture 6tilization and storage (CCUS); Membrane Separation and Technology; Waste-to-Energy Technologies; Explainable AI (XAI) and Trustworthy AI in Process Industries	Chemical Engineering Department
Design	Design	Visual Communication (Including Art & Visual Culture, Semiotics, Colour, Typography, Grids, Signage Design, Graphic Design, Illustration, Animation, Multimedia, Film & Video, Visual Narratives); New Media; Design Management, Design Strategy, Product-Service-Systems (PSS); Service Design; Design For Sustainability; Design for Social Innovation; System Design; Product Design and Development; Product Aesthetics; Form Design; Human Centered Design of Emerging-Technology-Based Products; Design Cognition; Understanding/Supporting Design Processes in Various Disciplines; Design and Culture; Makerspaces; Participatory Design; Co-creation; Frugal Design and Engineering; Frugal Innovation; Inclusive Design; Design For Health and Well Being; Human Computer Interaction (HCI); Interaction and Usability Engineering; Virtual Reality (VR); Voice And Conversational User Interfaces; Assistive Interfaces; User Interaction On Flexible Displays; Deformation Based Input	Design Department

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		Methods; Information Communication Technology For Development (ICTD); Input Methods for Digital Interfaces; Ergonomics (Including Occupational Health And Safety); Design Creativity and Innovation Studies; Design Education and Pedagogy; Design for Smart Cities; Design for Children; Toy Design; Electronic Product Design; Sound Design and Sonic Studies; Speculative Design; Furniture Design; Packaging Design; Automotive Design; Design for Additive Manufacturing (DfAM).	
Physics	Physics	Condensed Matter Physics – materials physics, materials for energy storage, energy harvesting and environmental applications, ferroelectric and oxide materials, raphene and analogue atomic thin materials, organic semiconductors, semiconducting materials, metal halide perovskite materials, photo-physics, thinfilm semiconductor devices, solar cells, LEDs, flexible devices, topological and low-dimensional quantum materials, electronic transport properties, imaging, smart magnetic materials, multiferroics, luttinger liquids, soft condensed matter, spintronics, statistical physics, random walk, percolation, porous media, climate physics, network, self-organization, active matters and collective motion, nonequilibrium statistical mechanics, hydrodynamics, quantum turbulence and nonlinear instabilities in BEC, strongly correlated systems, superconductivity, topological insulators, skyrmions, quantum turbulence, quantum phase transitions, ultracold atoms in optical lattices, nanomaterials and nanotechnology, polymer physics, AdS/CMT, magnetohydrodynamics, Luttinger and non-Fermi liquids, Bosonization, Machine learning in Physics Gravity, Astrophysics, and Cosmology – classical & quantum aspects of gravity, cosmology, and astrophysics – black hole physics, black hole perturbation, modified gravity in context of astrophysics and cosmology, theoretical cosmology, Early universe magneto-hydrodynamics (MHD), astrophysical flows around compact objects, X-ray astronomy of black hole X-ray Binaries, ultra high energy cosmic rays, black hole thermodynamics, quantum field theory on curved spacetime, Hawking-Unruh effect, Quantum information under relativistic regime as well as	Physics Department

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		curved backgrounds, Relativistic fluid and its thermodynamics in presence of gravity, Quantum aspects of gravitational waves. High Energy Physics – Theory and Phenomenology: dark matter phenomenology, neutrino physics, heavy flavor physics, collider phenomenology, QCD, precision calculations in the Standard Model and beyond, aspects of CP violation, matter-antimatter asymmetry, astro-particle physics/cosmological connections, inflation, effective field theory in particle and nuclear physics, physics of exotic hadrons. Experimental Particle Physics: B-physics at Belle and Belle II and neutrino physics at NoVA and DUNE. Laser and Photonics – fiber Optics, localized surface plasmon resonance, optical fiber sensors for structural health monitoring and environmental engineering, laser-Matter interaction, nonlinear optics, quantum optics, free space optical communication with structured light, super-resolution imaging, terahertz plasmonics and metamaterials, plasmonics materials, laser-induced breakdown spectroscopy, and plasma spectroscopy, Integrated photonic devices, Quantum optoelectronics, Non-volatile photonic memory, Bio-photonic sensor, Cavity non-linear optics, 2D polaritonics, Integrated Quantum Photonics, Laser Micromachining, Quantum Sensing with Color Centers. Quantum Optics and Quantum Technology – cavity quantum electrodynamics, circuit QED and quantum optomechanics, Cold atom-based quantum computer, coherent control of vector beam propagation.	
Chemistry	Chemistry	All Areas of Chemistry.	Chemistry Department
Mathematics	Mathematics	Harmonic Analysis, Functional Analysis and Operator Theory, Graphs and Matrices, Number Theory, Differential Equations and Numerical Analysis, Partial Differential Equations, Mathematical Biology.	Mathematics Department

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
	Probability, Statistics and Finance	Mathematical Finance, Probability and Stochastic Processes, Queueing Systems, Statistics, Biostatistics, Machine Learning, Clinical Trials, Spatiotemporal Forecasting and Synthetic Data (Generative AI).	
	Computer Science	Data Structures, Algorithms, Graph Algorithms, Distributed Algorithms, Computational Topology, Machine Learning-Based Network Security and Privacy.	
Humanities and Social Sciences	Archaeology	Pre and proto historic archaeology, Heritage studies	HSS Department
	Economics	All areas	
	English	1. Pre-modern/ early modern English literature (CE 1500-1700) 2. Digital literary studies	
	History	Environmental History of Eastern India, Economic History of Modern India, Literary History of Assam (Pre-modern/Medieval Period); Intellectual and Social History of Modern South and North-East India; Indian Military History, Indian Diplomatic History, International History of the 20th Century.	
	Linguistics	1. Phonology & phonological processing, prosodic aspects of atypical learning, tone and intonation in languages especially Tibeto-Burman and Indo-Aryan languages. 2. Language processing, sociolinguistics of north eastern languages, bilingualism. Cognitive linguistic study of languages (with special focus on north-eastern languages). 3. Acoustic phonetics, Phonetics of tone languages, Phonetics of Tibeto-Burman languages.	
	Political Science	Indian politics, political theory, political thought, international relations, and election studies.	
	Psychology	All areas	

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
	Sociology	Gender, violence and law; Gender, caste and space; Environment, development and society; Ethnic identity; Sociology of food; Media, performance and digital cultures; Historical sociology; Sociology of religion.	
Agro and Rural Technology	Agro and Rural Technology	Thermoelectric Devices, Advanced Cook stove Design and Testing, Emission Testing, Solar PV, Biomass and Bioenergy, Renewable Energy based Device Design, IOT, Food Biotechnology, Isothermal drying of agricultural products Food Biotechnology (for paper-based detection), Climate smart agriculture, AI and advanced analytics for data driven agricultural solution, Agro-Biology Optimization and agri-modelling; Climate Smart Agriculture; Greenhouse gases management in agro-ecosystems; Engineered Biochar & its applications; Wastewater treatment via Vermifltration, design of vermifiltration unit, Vermicompost/compost for disease suppressive ability, nutrient dynamics in composting/co-composting, Remote sensing for cropland monitoring; AI and advanced analytics for data driven agricultural solutions; spatial planning and geo-intelligence in agro-rural sector; Agribusiness Management, Agribusiness Incubation, Agricultural Supply Chain Management, Business Model Innovations, Entrepreneurship Development, Application of Artificial Intelligence, Machine Learning, Blockchain Technologies in Agri and allied sectors.	School of Agro and Rural Technology
Energy Science and Engineering	Energy Science and Engineering	All the areas related to renewable energy, clean coal technology, biofuels (Biodiesel, Bioethanol etc.), biolubricants, gasification, biomass pyrolysis, microalgae, internal combustion engine, energy efficiency and advanced energy storage systems, green hydrogen through electrolysis, battery thermal management system (BTMS), green building and energy management, fuel cell and electrocatalysts, CO2 to methanol, bio-oil via CTL, solar thermal, energy material synthesis, batteries and supercapacitors. Solar photovoltaics, fabrication, characterisation & numerical modeling of Perovskite solar cells. Power electronics application in power system; Power system monitoring and Control; Control of Power Electronics Interfaces for Distributed Energy Resources	School of Energy Science and Engineering

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		and Microgrids. EV charging infrastructure, electronic design, energy computation and simulation, device fabrication, integrated energy systems, and multigeneration energy systems, energy modelling, AI and energy optimization, Power Systems.	
Mehta Family School of Data Science and Artificial Intelligence	Data Science and Artificial Intelligence	1. Artificial Intelligence, Machine Learning, and Deep Learning Algorithms and their applications to Computer Vision: Object detection, Classification, Identification, Recognition, Image enhancement, Image matching; Equitable Precision Medicine: Transfer learning, Meta-learning, Few-shot learning; and Condition-based Monitoring: Fault diagnosis and Remaining useful life prediction. 2. Computer Vision using Deep Learning and Machine Learning, Adverse Weather Image/Video Restoration, Object Detection and Tracking, Scene Perception/Understanding 3. Optimization and Control of Stochastic Systems, Resource Allocation in Next-generation Wireless Communication Networks (5G/6G), Reinforcement Learning, Application of Machine Learning in Wireless Communication, Markov Decision Process, Multi-armed Bandit, Internet of Things (IoT), Federated Learning, Quantum Machine Learning. 4. Image processing: Biomedical image processing, Computer vision: Classification, segmentation, and tracking of the human eye, face, and hand, Computer graphics: Animation of human eye and face 5. Machine Learning in Robotic Neurorehabilitation 6. Speech, Audio, and Neural/Brain Signals: Modeling, Processing, Recognition, Generation, Multi-modal Approaches; Applications to scientific understanding, technology development, and healthcare. Speech modeling, recognition and understanding, Conversational speech modelling, Emotion-rich speech recognition and synthesis, Explainable AI for multimodal data processing and learning 7. AI for Cognitive Science: Psychology-driven experiments, Modeling and Data-driven hypothesis testing 8. AI/ML plus Physics	Mehta Family School of Data Science and Artificial Intelligence

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		9. Machine-learning based network security and privacy. 10. Reliability, Statistical Inferences, Transfer Learning, Applications of AI and ML 11. Statistical Signal Processing and Machine Learning, Non-linear regression, Time series analysis; Bayesian Inference in Signal Processing 12. Quantitative Finance, Financial Analytics. 13. Video Deep-fake Detection, Activity Recognition 14. Network Medicine, Systems Biology, Computational Biology 15. TinyML (camera, radar, smell and tactile sensor ML), NeuroAI, Neuromorphic Engineering, Computational Neuroscience, Few shot learning, Continual lifelong learning.	
Jyoti and Bhupat Mehta School of Health Sciences and Technology	Health Sciences and Technology	• Biomedical Devices and Sensors; Disease Diagnostics; Biomedical Imaging and Analysis; Development of MRI Contrast Agents; Microfluidics; Nanoelectronics; Nanobiotechnology. • Tissue Engineering; In-vitro Disease Models for Drug Screening; Cancer Biology and Stem Cells; Regenerative Medicine, regeneration biology and Stem Cells; Expanded Genetic Code. • Molecular Biophysics; Chemical Biology; Tox Screening of Phytochemicals/Drugs; Site-specific Protein Modification, Mathematical modeling and simulations of Biomolecules; Self-healing Hydrogels. • Health Data Science and Analytics; Preserving Privacy in Health Data Sharing; Ergonomics and Design for Healthcare; Quantum Technology for Healthcare Applications. • Biomaterials; Artificial Limbs and Prosthetics; Biomechanics; Transport Processes in Physiological Systems; Medical Waste Disposal and Degradation; Cardiovascular Science and Engineering. • Bioorganic, Bioinorganic and Medicinal Chemistry; Drug Delivery; Environmental Health and Toxicology. • Molecular Neuroscience and Cancer Neuroscience, Pharmacology and Toxicology, Large-Scale Genomics and Transcriptomic Data Analysis, Cheminformatics, Protein Engineering.	Jyoti and Bhupat Mehta School of Health Sciences and Technology

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
School of Business	Business	Operations Research, Organizational Behaviour and Human Resource Management	School of Business
Environment	Environment	• Water and industrial wastewater treatment technologies (membrane separation, AOPs, physicochemical methods, microalgal and microbial processes, etc.) • Groundwater treatment (arsenic, fluoride removal, etc.) • Nanomaterials and biomaterials for environmental applications (sensor development, catalysis, adsorbent development, healthcare, antimicrobial activity, water treatment, etc.) • Solid waste management and valorization • Environmental microplastics and its remediation • Atmospheric chemistry of oxygenated volatile organic compounds • CO_2 capture, separation, and production formation (electrochemical, photochemical, adsorption, membrane processes, and modeling & simulation studies) • Radical initiated reaction with CFC alternatives, QM/ MM studies on enzyme catalysis • Micro-nanobubble science and technology • Deep eutectic solvent (DES) and ionic liquids(ILs) • Extraction of sulphate ions from coal sludge using Ettringite precipitation • Molecular dynamics simulation of biological molecules • Prebiotic pathways in the extraterrestrial atmosphere • Environmental genomics of fungi • Bacterial isolation from nature and its uses • Semisynthetic organisms with expanded genetic codes for environmental applications, Membrane development for fuel cells • Intelligent integration of AI and IoT for air quality monitoring, Sustainable functional food • Biodiversity and wetland ecology • Eco-system services and valuation	Centre for the Environment

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
Nanotechnology	Nanotechnology	Nano/Bio Materials Science and Engineering; NanoTheranostic Devices; Nano/Bio-Electronics and Sensors; Experimental and Computational studies of micro- and nano-fluidics, Molecular Simulations; Polymer self-assembly; Polymer Nanocomposites; Nano Devices and Applications; Flow Chemistry; Catalysis for Energy; Energy Applications; All areas of Chemistry and Physics including Nanoscale Materials, Polymers, Optoelectronics, and Photonic applications; Nanoelectronic Devices: Non-Volatile Memory Devices and Technologies, Plasmonic Devices, Neuromorphic Devices, Low-Dimensional Semiconductors and Devices, Semiconductor technology, Spintronic Devices, Photovoltaics and Photodetectors; Green Hydrogen Generation: Organic, Hybrid, Flexible, and Printable Electronics; Bio-Inspired Wettability and Design of Water Repellent and Conductive Interfaces.	Centre for Nanotechnology
Linguistic Science and Technology	Linguistic Science and Technology	Natural Language Processing, Computational Phonology, Speech Analysis, Spoken Language Resources, Neuroimaging of Language disorders, Quantitative Phonetics, Natural User Interfaces, Vision and language, Vision and Speech, Document Image Processing, Virtual / Augmented / Mixed Reality, Neurocognitive response to live music with and without language	Centre for Linguistic Science & Technology
Disaster Management and Research	Disaster Management and Research	Structural health monitoring, Service Life Assessment of Structures, Low-cost housing; Sustainable construction materials; Vulnerability, adaptation and DDR in urban cluster; Transport (accessibility and disaster resilience); Earthquake ground motion characterization; Seismic resilience of structures; Seismic and blast-induced disasters; Design for disaster risk reduction; Gamification for Disaster Management; Landslide prediction and mitigation, mudflow/debris-flow; Disaster modeling using AI and Machine Learning; Deformation of metallic structures under crash loading conditions; Gender Perspectives in DRR; Non-equilibrium transport of pollutants in soil; Structural Health Monitoring & Reliability Analysis; Climate change Vulnerability & Adaptation assessment in flood and drought affected areas; Climate-smart agriculture; Community based Disaster Risk Reduction, Vulnerability & Adaptation assessment in flood and drought affected areas;	Centre for Disaster Management and Research

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		Climate-smart agriculture; Community based Disaster Risk Reduction; B5G/6G for Disaster Management; IoT for Diasater Management.	
Sustainable Polymers	Sustainable Polymers	All areas of Polymer Science and Engineering (including Organic electronics, Polymer liquid crystal, Polymer nanocomposites, Implant materials), Solid Waste Management, Agriculture, Biotechnology with Emphasis on Biopolymers, Monomers, Biocatalysis, Toxicology, Migration Studies, Polymer Ecology, Life Cycle Assessment, Polymer Product Design and Development, Orgnocatalyst, Organometallic catalysis, Green Chemistry.	Centre for Sustainable Polymers
Indian Knowledge Systems	Indian Knowledge Systems	• History of Science, Technology, and Engineering in India; • Water conservation systems; • Home Construction Materials; • Vastu and Sidhanta/Samhita-Jyotisha • Temple Architecture; • Study of Instruments from Indian texts; • Science and Technology of Ksheerapaka extracts; • Ontological design; • Herbal/Ayurvedic Medicinal Products; • Integrative Medicine; • Psychology and Consciousness studies; • Meditation and Health; • Indigenous cultivation systems and Indigenous trade	Centre for Indian Knowledge Systems
Intelligent Cyber Physical Systems	Intelligent Cyber Physical Systems	Internet-of-Things (IoT), Sensors, Embedded Systems; Robotics, Control and Sensing: Modelling, Analysis and Design of Robotic Systems, Intelligent Sensing and Control for Autonomous Vehicles, Control of Swarm Systems, Sensor and Actuator Design; Artificial Intelligence: Machine Learning, Deep Learning, Computer Vision, Natural Language Processing, Speech and Audio Signal Processing, Biomedical Signal & Image Processing, Data Science and Analytics; Underwater Systems: Underwater Systems Design and Development, Underwater Exploration, Underwater Structural Analysis, Sonar and Underwater Acoustics,	Centre for Intelligent Cyber Physical Systems

Academic Division (Department/School/ Centre)	Specialization	Areas of Research	Link to Dept./ Centre/ School
		Compressed Air Energy Storage, Power Electronics for Underwater Systems, Underwater Concrete Printing; Biomechanics and Biomedical Devices; Smart and Intelligent Manufacturing: Robotics Manufacturing, AI and ML in Manufacturing Processes, Digital Twin of Manufacturing Systems and processes.	
Centre for Sustainable Water Research	Sustainable Water Research	Hydrology and Water Resources Engineering (Surface Water; Groundwater; Atmospheric Water); Hydraulics; Socio-economic aspects of water; Water Economics; Water governance and policy; Transboundary water management; Sustainable Development of Water Resources; Remote Sensing and GIS application in Water Resources; Climate change impact, mitigation, and adaptation, Contaminant Transport; Water Filtration; Chemistry of nanomaterials for sustainable water; Waste Water Treatment; Pipe Networks; AI and ML applications in water research; and allied areas related to sustainable water research.	Centre for Sustainable Water Research
Centre for Drone Technology	Drone Technology	Autonomous Vehicles: Sensors, Embedded Systems, Control and Sensing, Design and development of Drones; Artificial Intelligence: Machine Learning, Computer Vision, Signal Processing, Image Processing; Underground Exploration, Remote Sensing and Geoinformatics (Geomatics), Geodesy, Atmospheric Science, Societal problems and mitigation.	Centre for Drone Technology