



राष्ट्रीय प्रौद्योगिकी संस्थान जमशेदपुर
जमशेदपुर -831014 , झारखण्ड , भारत

National Institute of Technology Jamshedpur
Jamshedpur- 831014, Jharkhand, India



INFORMATION BROCHURE

FOR ADMISSION TO

Ph.D PROGRAMME

ACADEMIC SESSION 2024-25

(AUTUMN SEMESTER)



राष्ट्रीय प्रौद्योगिकी संस्थान जमशेदपुर
जमशेदपुर -831014 , झारखण्ड , भारत
National Institute of Technology Jamshedpur
Jamshedpur- 831014, Jharkhand, India

Ref. No. NITJSR/ACD/2024/84

Dated: 13/04/2024

NOTICE – S – 33 /2024

Admission to Ph.D. Programme for Autumn Semester 2024-2025

Link for online application: <https://online.nitjsr.ac.in/phd2024>

INFORMATION BROCHURE

1. ABOUT THE INSTITUTE

National Institute of Technology (NIT) Jamshedpur is an Institution of National Importance set up by an Act of Parliament (Act 29 of 2007) namely, the National Institutes of Technology Act, 2007. As per the provisions of the said Act, NIT Jamshedpur offers academic programmes: B. Tech. (Hons.), M. Tech., MCA, M. Sc. and Ph.D. in various disciplines. NIT Jamshedpur has well qualified and experienced faculty and dedicated supporting staff.

2. Admission to Ph.D. Programme for Autumn Semester 2024-2025.

2.1 Name of the Departments offering the Ph.D. Programme and Research Areas

Sl. No.	Name of the Department	Broad Research Areas offered for all PhD Programmes in the Department
1	Civil Engineering (CE)	Structural Engineering, Concrete Technology, Earthquake Engineering, Offshore Structure, Soil Structure Interaction, Geotechnical Engineering, Vibration and Stability, Stability Analysis, Foundation Engineering, Ground Improvement, Reinforced Earth, Geo-Environmental Engineering., Geo-synthetics Engineering, Transportation Engineering, Pavement Design, Traffic Engineering, Water Resources Engineering, Open Channel Hydraulics, Ground Water Hydrology, Water Structure Interaction, Water Resource Managements, Computational Fluid Dynamics. Development of alternative road materials and charging of electric vehicles during running on roads.
2	Computer Science and Engineering (CS)	Supply Chain Management, Data Mining, Computational Complexity, Software Engineering, Soft Computing, system reliability modeling and analysis, software reliability, machine learning, pattern recognition, data analytics, IOT, Network Security, Image Processing, Comp Networks, Database Analysis, Machine learning, Pattern Recognition
3	Electrical Engineering (EE)	Control Systems, Power Systems, Power Electronics, Power System Protection, Renewable Energy Systems, Electrical Machines and Drives, Control of Robotic manipulators and drones, Electric Vehicles, FACTS, artificial intelligence and machine learning and HVDC, smart grid and micro grid.
4	Electronics and Communication Engineering (EC)	Communication Systems, Computer Networking, MEMS Microelectronics & VLSI Design, Circuit & Devices, Signals & System, Image Processing, Microwave, Antenna and R/F Engineering, Embedded System & IoT, Soft Computing, Industrial Electronics & Drives, Artificial Intelligence, Nanotechnology, Micro/Nano Sensor, Underwater Communication, Wireless Sensor Network.

5	Mechanical Engineering (ME)	Machine Design: Composite Materials, Vibrations and Dynamics, Failure and Fracture Mechanics, Biomechanics, Design and Dynamic analysis of Mechanical Systems, Structural Mechanics, Robotics and automation, Noise control, CAD /CAM, FEM, Value Engineering, TPM, TQM and SCM Thermal Engineering: Heat & Mass Transfer, Solar Energy and other Renewable Energy, Energy Systems, I.C. Engines, Gas turbines, Refrigeration and Air-Conditioning, Thermo-Fluids, Nano-fluids, Rheology, Turbo-machines, CFD, Tribology, Design- Composites Structures, Bio-implants,
6	Metallurgical and Materials Engineering (MM)	Physical Metallurgy, Phase Transformation, Extractive Metallurgy, Surface Engineering, Biomaterials, Rapid solidification, Nanotechnology, Powder Metallurgy, Mineral Beneficiation, Functional Materials and High temperature materials Ceramics, Polymers and Composites.
7	Production and Industrial Engineering (PI)	Manufacturing Processes, Product Design and Development, CAD/CAM and Robotics, Industrial Engineering and Management, Advanced Materials, Manufacturing Systems Engineering, Energy Management, Non -traditional manufacturing, Supply Chain Management, Operation Research/Operations Management, Decision Making, Advanced fusion welding, process monitoring and control, friction stir processing, artificial intelligence.
8	Chemistry (CH)	Organic Chemistry, Analytical Chemistry, Computational Chemistry, Physical Chemistry: Surface Chemistry & Molecular Spectroscopy, Inorganic Chemistry: Organometallics, Homogeneous & Heterogeneous catalysis, Environmental Chemistry: Waste Disposal Management, Aerosols, decontamination of water & Atmospheric Chemistry, Materials Science: Nano-materials and Alternative energy materials.
9	Humanities, Social Sciences and Management (HS)	Financial Inclusion, Micro-Finance, Financial wellbeing, Ethics, Policy studies, Livelihood, Sustainable Finance, Entrepreneurship. Marketing Management, Strategic Management, General Management, Stress Management, General Management. Organisational Behaviour, Change Management, Organisational Development, Leadership Development, Emotional Intelligence, Human Resource Management, Strategic Human Resource Management, Mindfulness & Resilience, Conflict Management, Industrial Relations, Employee Welfare & Administration, Compensation Management, Labour Laws. Yoga and Science of Living Systems.
10	Mathematics (MA)	Operation Research, Statistics, Complex analysis, Special functions, Linear algebra, Matrix theory, Control theory, Integral Equations. Fluid dynamics, Sediment transport, Magneto hydrodynamics, Numerical analysis, Cryptography, Network security, Commutative and Computational algebra. Differential Equations. wavelet methods
11	Physics (PH)	Laser Applications, Nuclear Physics, Experimental condensed matter physics (magnetism, strongly correlated system), nano-materials and molecular spectroscopy, Computational Physics, Functional Materials, Cosmology and Astrophysics

2.2 Specific Area of Research (see Annexure-II)

***Note: Further details about department specific specializations and notifications can be found on departmental webpage from the institute website. Research area is indicative only and subject to willingness and availability of the supervisor.**

2.3 Categories of Ph. D. Programme:

(a) Institute Research Scholars (Full Time):

Candidates under this category are entitled for fellowship from the Institute as per MoE norms. The candidate must have qualified GATE/NET or any other equivalent test recognized by MoE for award of fellowship.

(i) Vacancy in various department under this category:

Department	CH	CE	CS	HS	EC	EE	MA	ME	MM	PI	PH	Interdisciplinary	Total
Vacancy	8	16	13	2	12	14	3	22	12	09	03	9*	123

* Interdisciplinary is optional for candidates. They may give their choice (Yes/No) in the application form.

*Interdisciplinary is for IRS category only. Interdisciplinary research area requires maximum two faculty members to join together to supervise the PhD work of a student (one main supervisor and co-supervisor) from other departments (not from the same department) or equivalent academic/research Institutes/organizations (national/international), not from the Private Institutions/Organizations.

Reservations for SC/ST/OBC/PWD/EWS are applicable as per GOI norms only for IRS category.

(b) Sponsored Research Scholars (Full -Time):

Candidates under this category receive financial support from AICTE under QIP scheme or from Government Institutes/ organizations, reputed industries under study leave. Foreign students shall be sponsored by their Government or awarded scholarship by Govt. of India, ICCR or other such organizations/ agencies.

(c) Self-Financed Research Scholars (Full -Time):

Candidates under this category are those who support themselves or receive fellowship from other agencies such as UGC, CSIR, DST, JEST, etc.

(d) Self-Financed Research Scholars (Part-Time):

Research scholars under this category shall be persons employed in Industries/R&D organizations/Institutions. They shall be required to furnish No Objection Certificate (NOC) from their employer. The candidate will produce a certificate that he will be permitted for attending classes and examinations as and when conducted by the Institute.

(e) Faculty/Staff/Sponsored Project Fellow of N.I.T. Jamshedpur (Part -Time):

Regular faculty members, regular staff members and sponsored project fellows of N.I.T. Jamshedpur are eligible for admission to Ph. D program in concerned Departments.

(f) Executive PhD

Regular working personnel of Defense/R&D/Listed reputed companies with at least three years of experience are eligible for admission to PhD program in concerned Departments. They shall be required to furnish No Objection Certificate (NOC) from their employer. However, they need not to attend classes at the institute. Course work can be carried out through NPTEL/MOOC/SWAYAM. There has to be minimum 30 days face to face interaction with the supervisor in the Institute in one academic year. Provision of Joint Guidance from the parent organization.

2.4 Qualification for Eligibility:

(a) Ph. D in Engineering:

Master Degree in relevant branch of Engineering/Technology or MCA with minimum 60% marks or equivalent CPI 6.5.

OR

Bachelor's degree in relevant branch of Engineering/Technology with minimum 80 % marks or equivalent CPI 8.5.

(b) Ph. D in Sciences

Master's Degree in the relevant subject with a minimum 60% marks or equivalent CPI 6.5

OR

Bachelor's degree in Engineering/Technology with minimum 80 % marks or equivalent CPI 8.5.

(c) Ph. D in Humanities, Social Sciences and Management

Master's Degree in the relevant subject* with a minimum 60% marks or equivalent CPI 6.5

OR

Bachelor's degree in Engineering/Technology with minimum 80 % marks or equivalent CPI 8.5.

Note:- **"Master's Degree in the relevant subject" for Humanities, Social Sciences and Management Department means a Master Degree in MBA/M.Com./MA English/MA Yoga and Science of Living Systems/Master of Physical Education (MPed).".

3.0 Selection Procedure

The selection procedure for admission to Ph.D. Programme is based on consistently good academic record, written test and interview conducted by the Department. Reservations for SC/ST/OBC/ PWD/ EWS are applicable as per GoI norms.

4.0 How to Apply

The candidates are advised to fill their application form only through online mode and pay the requisite fee through SBI Collect.

The online application form and the information brochure for admission to Ph.D. programme are available at <https://online.nitjsr.ac.in/phd2024> in the institute website www.nitjsr.ac.in

Application Fee

IRS	Rs. 1,000/- for OPEN/OBC/ EWS candidates and Rs. 500/- in the case of SC/ST/PWD candidates.
Non-IRS	Rs. 1,000/- for all

- The candidates who are employed and wish to do Ph.D. must submit SPONSORSHIP/ NO OBJECTION CERTIFICATE from the employer at the time of admission, without which admission will not be possible.
- Check the following documents are attached to the application form:
 - Proof of Payment
 - Self-attested copy of SSC in support of Date of Birth
 - Self-attested copy of intermediate /(10+2) Certificate
 - Self-attested copies of Degree certificates and Mark sheets of all the qualifying examinations
 - Self-attested copy of the caste certificate (in case of SC/ST candidates)
 - For OBC candidates, self-attested copy of OBC certificate issued after 31/03/2024 only as per the format given in the Annexure-I is accepted
 - Candidates with 40% and more physical disability, would be considered as PwD Candidates
 - List of publications (if any)
 - Self-attested copy of EWS certificate issued after 31/03/2024 by the competent authority.

Important Dates

Advertisement on the Institute website	13/04/2024 (Saturday)
Last date for receipt of application forms	06/05/2024 (Monday)
Intimation regarding written test and interview call to be uploaded on institute website	20/05/2024 (Monday)
Date of written test and interview at NIT Jamshedpur	30/05/2024 (Thursday)
Date of announcement of results	07/06/2024 (Friday)
Date of admission	17/06/2024 (Monday)
Session begins from	29/07/2024 (Monday)

Note: Students may require staying one more day if interview is not completed on scheduled date.

5.0 GENERAL INSTRUCTIONS

- Link for online application: <https://online.nitjsr.ac.in/phd2024>
- Candidates should specify broad areas of research in the application form.
- All candidates seeking admission to Ph. D. Programme are required to fill and upload their application form (online) along with all required documents by **06/05/2024 (Monday)**.
- If a candidate is applying in more than one department, then he/she should fill separate application forms with the prescribed application fee for each department.
- Interdisciplinary is for IRS category only, not for other PhD categories.
- List of short-listed candidates for the written test and interview will be uploaded on the Institute website only.
- The candidates are required to visit our website for fee structure/faculty expertise etc. and also advised to visit our website regularly for updated information about the admission to Ph.D. Programme for 2024-25.
- No separate interview letter / communication will be sent to any individual
- All candidates selected for admission shall be required to deposit the Institute fee at the time of admission.
- candidates need not to send the hard copy of applications.
- For any technical query, contact at phdadmission@nitjsr.ac.in
- For any administrative query, contact at dean.ac@nitjsr.ac.in

Proforma for Other Backward Class (OBC Certificate)

**(CERTIFICATE TO BE PRODUCED BY OTHER BACKWARD CLASSES APPLYING FOR
ADMISSION TO CENTRAL EDUCATIONAL INSTITUTIONS (CEIs), UNDER GOVERNMENT OF
INDIA)**

This is to certify that Shri/Smt./Kum. _____ Son/Daughter of
Shri/Smt. _____ of Village/Town

_____ district/Division

_____ in the _____ State belongs to the

_____ Community which is recognized as a backward class under:

- i) Resolution No. 12011/68/93- BCC(C) dated 10/09/93 published in the Gazette of India Extraordinary Part I Section I No.186 dated 13/09/93.
- ii) Resolution No. 12011/9/94-BCC dated 19/10/94 published in the Gazette of India Extraordinary Part I Section I No. 163 dated 20/10/94.
- iii) Resolution No. 12011/7/95-BCC dated 24/05/95 published in the Gazette of India Extraordinary Part I Section I No. 88 dated 25/05/95.
- iv) Resolution No. 12011/96/94-BCC dated 09/03/96.
- v) Resolution No. 12011/44/96-BCC dated 6/12/96 published in the Gazette of India Extraordinary Part I Section I No. 210 dated 11/12/96. vi) Resolution No. 12011/13/97-BCC dated 03/12/97.
- vi) Resolution No. 12011/99/94-BCC dated 11/12/97.
- vii) viii) Resolution No. 12011/68/98-BCC dated 27/10/99.
- ix) Resolution No. 12011/88/98-BCC dated 6/12/99 published in the Gazette of India Extraordinary Part I Section I No. 270 dated 06/12/99.
- x) Resolution No. 12011/36/99-BCC dated 04/04/2000 published in the Gazette of India Extraordinary Part I Section I No. 71 dated 04/04/2000.
- xi) Resolution No. 12011/44/99-BCC dated 21/09/2000 published in the Gazette of India Extraordinary Part I Section I No.210 dated 21/09/2000. xii) Resolution No. 12015/9/2000-BCC dated 06/09/2001.
xiii) Resolution No. 12011/1/2001-BCC dated 19/06/2003.
xiv) Resolution No. 12011/4/2002-BCC dated 13/01/2004.

xv) Resolution No. 12011/9/2004-BCC dated 16/01/2006 published in the Gazette of India Extraordinary Part I Section I No.210 dated 16/01/2006.

Shri/Smt./Kum. _____ and/or his family ordinarily reside(s) in the

_____ District/Division of _____ State. This is also to certify that he/she does not belong to the Persons/sections (Creamy Layer) mentioned in Column 3 of the Schedule to the Government of India, Department of Personnel & Training O.M. No. 36012/22/93-Estt.(SCT) dated 08/09/93 which is modified vide OM No. 36033/3/2004 Estt. (Res.) dated 09/03/2004 or the latest notification of the Government of India.

**District Magistrate/Competent Authority
with Seal**

Dated:

NOTE:

- (a) The term "Ordinarily" used here will have the same meaning as in Section 20 of the Representation of the People Act, 1950.
- (b) The authorities competent to issue Caste Certificates are indicated below:
- i) District Magistrate / Additional Magistrate / Collector / Deputy Commissioner / Additional Deputy Commissioner / Deputy Collector / 1st Class Stipendiary Magistrate / Sub-Divisional Magistrate / Taluka Magistrate / Executive Magistrate / Extra st Assistant Commissioner (not below the rank of 1 Class Stipendiary Magistrate)
 - ii) Chief Presidency Magistrate / Additional Chief Presidency Magistrate / Presidency Magistrate.
 - iii) Revenue Officer not below the rank of Tehsildar' and iv) Sub- Divisional Officer of the area where the candidate and / or his family resides.
- (c) The annual income /status of the parents of the applicant should be based on financial year ending March 31, 2023.

Declaration /undertaking - for OBC Candidates only

I, _____ Son/Daughter of Shri _____

resident of village/town/city _____ district _____ State hereby declare that I belong to the _____ community which is recognized as a backward class by the Government of India for the purpose of reservation in services admission in Central Government Institutions as per orders contained in Department of Personnel and Training Office Memorandum No. 36012/22/93 – Estt. (SCT), dated 8/9/1993. It is also declared that I do not belong to persons/sections (Creamy Layer) mentioned in Column 3 of the Schedule to the above referred Office Memorandum, dated 8/9/1993, which is modified vide Department of Personnel and Training Office Memorandum No. 36033/3/2004 Estt. (Res.) dated 9/3/2004 or the latest notification of the Government of India.

I also declare that the condition of status/annual income for creamy layer of my parents/guardian is within prescribed limits as on financial year ending on March 31, 2024.

Place:

Signature of the Candidate

Date:

Declaration/undertaking not signed by Candidates will be rejected

No-Objection Certificate for PhD Employed & Part-Time Category Candidates

(This should be typed on the letter head of the employee's organization)

Reference No.:

Date:

To
The Director
National Institute of Technology
Jamshedpur

Sub.: No-Objection Certificate for pursuing PhD (Part-Time) at NIT Jamshedpur

Dear Sir,

We have no objection if Mr./Ms.....an employee of our organization/ institute, is admitted to the Ph.D. Programme in the Department of / Center for at NIT Jamshedpur as a **part-time** student.

It is certified that he/ she has completed year of service in our organization/ institute as a regular employee.

We shall give him/her leave of absence at our organization to attend classes of course work of Ph.D. programme at NIT Jamshedpur.

Signature & Seal of Head of the Organization/ Institute

Annexure-II	
Department	Specific Area of Research
Chemistry	Organic Synthetic methodology, Photocatalysis and Organic Sensors
	Molecular Spectroscopy, Quantum Chemical Calculations, Biophysical Chemistry, Solar Energy
	Nanomaterials Chemistry: Advanced Nanomaterials for Adsorption, Photocatalytic Degradation of water pollutants, Biomedical Applications
	Organometallics, Catalyst designing for reduction of CO ₂ to value added products, Inorganic Chemistry
	Clean Energy Research: Synthesis of Nanomaterials for Photocatalytic Hydrogen generation and CO ₂ Reduction, Photocatalytic remediation of water pollutants.
	Organic Synthesis (methodology), Asymmetric Synthesis, Photoredox Catalysis, Total Synthesis, Electrochemistry in Organic Synthesis
	Chemistry of Materials, Organic Synthesis, Chemistry of Natural Products
	Environmental Chemistry, Atmospheric Chemistry, Microplastic, Water Research, Recycling technology and waste management, Health risk, Environmental Engineering.
	Carbohydrate-based Fluorometric materials: Explosive and heavy metal ions/anions detection; applications in Photodynamic Therapy and Organoelectronics (Interdiscipline)
	Chemistry of Natural Products, Corrosion Protection Inhibitor
Department of Civil Engineering	Landslide Prediction, Monitoring and Early Warning; Model Test on Slope Failure; Valorization
	Geophysical Investigations, structural fire safety, Seismic Characterization, Site response Analysis
	Water Resources Engineering, Hydrology, Water Resources Systems, Water Distribution
	Ground improvement, Geo-environmental pollution, Unsaturated soil behaviour, Image analysis, Grounding behavior of improved ground.
	Fluvial Hydrodynamics, Turbulence Characteristics, Sediment Transport, Open Channel Hydraulics
	Ground Improvement, numerical modelling, soil structure interaction
	Soft Ground Improvement, Numerical Modelling, Designing with Geosynthetics and GeoNaturals, Stone columns,
	Water Resources Engineering, Hydrology, Climate Change Modelling, Flood Routing & Open Channel Hydraulics, River Basin Management Studies, Soil Erosion, Machine Learning & AI Applications, Geospatial Technology Applications
	Experimental and Numerical investigation of Offshore floating wind turbine support systems
	Flood forecasting, real time reservoir operation, real time flood forecasting, urban flood forecasting, water distribution network, watershed management
	Seepage Analysis, Ground Improvement, Stability of Structure, Soil Structure Interaction, River Bank Filtration, Foundation Engineering, [Analytical, Numerical & Experimental Investigation]
	Advanced Concrete Technology, Non-conventional Construction Materials, Geopolymer Concrete, Self-Compacting Concrete, Waste Material Utilization in Construction, Low Cost Building Materials
	Development of alternative building materials, Concrete Technology, Structural Engineering, Self
	Performance Based Seismic Design, Structural Health Monitoring, Characterization of Geopolymer Concrete, High Strength and High Performance
	Concrete Technology, Structural Engineering, Structural Health Monitoring, Structural Dynamics,
	Development of alternative road materials and charging of electric vehicles during running on
Department of Computer Science and Engineering	Cloud Computing, Fog/Edge Computing, Blockchain, IoT
	Image Processing, Computer Vision, Machine Learning, Deep Learning
	IoT, Machine Learning, AI, Optimization, Heuristic Algorithms, Cloud Computing
	Hyperspectral Imaging, Artificial Intelligence, Biomedical, Image Processing, Data Science
	Machine Learning, Deep Learning, Feature Selection, Natural Language Processing, Medical Mining, Nature Inspired Algorithm, Intrusion Detection System
	IoT, Wireless Sensor Network, Soft Computing, Nature Inspired Algorithm, Deep Learning, Machine Learning
	Network Security, IoT Routing Performance Enhancement, Security Threat Modeling and Detection
	Computer Vision, Image Processing, Medical Image Processing, DNA Computing, Machine and Deep Learning
	Quantum Computing, DNA Computing, Machine Learning, Deep Learning
	Machine Learning, Deep Learning, Computer Vision, Natural Language Processing
	Software Maintenance, Software Reliability and Applications of Machine Learning and Deep Learning
	Machine/Deep Learning, Natural Language Processing, Data/network security, Image/Video processing
	Network Optimization, Data Mining, Security, Machine Learning, Quantum Computation

	Software Engineering, Image processing, Information security, Machine Learning, Fuzzy logic, Reliability engineering
	Computer Applications, Software Engg., Supply Chain Mgmt, Machine and Deep Learning
Electrical Engineering	Electrical Machines, Power Electronics & Drives, Power System (Engineering & Economics), Renewable Power Generation, Smart Grid, High voltage Engineering
	Power Systems; Renewable Energy (Wind & Solar Energy); Application of Optimal Control in Power Systems and Renewable Energy; Soft Computing Techniques and Electric Vehicle modelling
	Control systems, Power electronics, Electric vehicle
	High Voltage Engineering, Power System
	Reactive power planning, FACTS Devices, Optimization Techniques, Electrica Vehical
	Power Electronics, Applications of Resonant Converters, Converter based Renewable Energy systems, Electric vehicle charging applications.
	Protection of Transmission line/Power Network including FACTS or HVDC, Islanding detection/Power quality of Microgrid, Protection of Mirocgrid using soft computing and basic algorithms,Fault detection, direction estimation during power swing, EV modelling
	Power system protection, microgrid, renewable-based distributed generation, and electric power quality
	Power Electronic power processor for renewable energy application; power processor for EV charging; Hybrid power processor for DC micro grid application; converter modelling and control Model order reduction and its application; Fault detection and accomodation
	Power Systems, FACTS Devices, Soft Computing Techniques
	Reactive power planning, FACTS Devices, Optimization Techniques, Electrica Vehical
	System Modeling and Simulation, Technoeconomic Assessment of Hybrid Energy Systems, and Power Electronics and Drives, Electric Vehicle, Design and Control of Power Electronics Converters for different Renewable Energy sources integrated to grid , Vehicle to Grid & Grid to Vehicle power flow technology, SMPS, Battery Management System , Power Quality
	Power System Protection
	Power System Dereregulation and Restructering, Powerr Market, Network Costing, Grid Integration of Electric Vehicle and Machine/Deep Learning, Renewable Energy Sources, Congestiun Management, Microgrid and Power Quality, Islanding Detection Techniques, Optimal Power Flow, Power System operation and Control
	Electronics and Communication Engineering
Image and video processing, Embedded system, IoT, Robitics, Nondestructive testing and structural health monitoring.	
Digital Communications, Mobile Communications, Unmanned Aerial Vehicles (UAVs)-Assisted Communications, Radio Frequency (RF) Energy Harvesting, Tera-Hertz (THz) Communications, Fading Channels.	
VLSI Design, Microelectronics, Semiconductor Devices and Sensors, UAV Drones	
Nanoelectronics, VLSI, Gas Sensor Devices ,Photovoltaic	
Micro/ Nanoelectromechanical Systems (MEMS/NEMS), Microelectronics and VLSI, Piezoelectric Sensors & Actuators, SAW Devices, Internet of Things (IoT).	
Analog Circuits, Analog Integrated Circuits, Analog Memristors, Analog Signal processing , optical integrated systems	
Microwave Engineering, 5G & 6G Technology, Microwave and THz sensor, Metamaterial, Material Characterization, Microwave absorbing material, Medical Implant, Environmental pollution detection, Adulteration detection, Biochemical,Broadband Dielectric Spectroscopy	
Signal processing, Wireless Sensor Network and IoT	
Optical Fiber Communication, Optical switches, logic gates, optical digital computations and Optical Sensors.	
FPGA prototyping of acoustic MODEM, Underwater Acoustic Communication, Micro-scale Energy Harvesting, Device-to-device communication for 5G and 6G networks, Wireless Sensor Node Design	
Microelectronics and VLSI, Fabrication and Characterization of Photovoltaic Devices, Bio Sensors, Photo Detector, Gas Sensors etc.	
Wireless Communication, Quantum Communication, Channel Coding, RF Circuits for 5G/6G, FPGA based DSP in Communication	
Antenna and Filtenna design for wireless communication and microwave applications including biomedical, agriculture, defence. Wearable antennas, Metasurface and metamaterial-based sensors and absorbers, Application of soft computing techniques for optimization	
Microwave Engineering, Material characterization, Biochemical, Broadband Dielectric Spectroscopic, DIP	

Humanities Social Science and Management	Organisational Behaviour, Human Resource Management , Conflict Management, Industrial Relations, Employee Welfare , Psychological Resilience and Stress Management, Emotional Intelligence, Leadership, International Business and Strategic Management
	Marketing Management, General Management, Strategic Management, Entrepreneurship, Stress Management
	Financial Inclusion, Micro-Finance, Financial Well Being, Sustainable Finance, Livelihood, Policy studies, ethics, Entrepreneurship,
Math	Fluid Dynamics
	Cryptography
	Complex Analysis, Special Functions, Mathematical Analysis
	Commutative algebra and computational algebra
	Turbulent Flow, Non-local transport, Fractional Modelling, Informational Entropy-based modelling, Biofluid Mechanics
	Magnetohydrodynamics, Machine Learning Applications in Fluid Mechanics, Nanofluid Flows
	Combinatorial Number Theory: Zero-sum problems, Graph Theory
	Mathematical Modelling, Fractional calculus and it's Applications, Epidemiological modelling, Chaos Theory, Analytical, Numerical and Wavelet Methods
	Fluid Dynamics, Nanofluid flow Modelling, Numerical analysis of fluid flow problems, Spectral Methods
Mechanical Engineering	Sampling Theory, Statistical Inference
	Structural Vibration, Machine Condition/Health Monitoring, Vibration & Noise Control, Metal Matrix Composite
	Thermal Engineering, Fluid dynamics, Heat transfer inclusive of micro and nano scale transport, Multiphase flows, Computational Fluid dynamics, etc.
	Composite materials, vibrations, tribology etc
	Design-Composite Structure, Failure and Fracture of Materials, UAV, Nanocomposites, Bio composites, Additive Manufacturing, Soft Actuator, Data-Driven Material Design, Technical Textiles
	Design - Composite Structures
	Thermal Engineering, Energy from biomass and waste, Hydrogen operated Engine, Emission control technology, Thermo fluid analysis, hydrothermal Gasification
	Design - Composite Structures
	Design-Musical Acoustics, Robotics, Vibration, Dynamics, Elasticity
	ThermoFluid - Airfoils & Aero-acoustic
	Thermal- Airconditioning, Human Thermal Comfort, Nano Particle refrigeration simulation
	Thermal - Boiling Heat Transfer, Micro/Nano scale Fluid and Heat Transport, Surface Wettability, Surfactant, Biosurfactant, Nanofluids
	Design-Metamaterials, Compliant Mechanisms
	Thermofluid including Microfluidics and Natural convection, Advanced manufacturing processes multiphase flow, erosion and coating, CFD, hydraulic design
	Thermal- Hydrogen Gas-Turbine
	Heat Transfer
	Thermal -Heat and mass transfer, Renewable energy
	Thermal-Free surface flow Natural convection and CFD
	Design- Composites Structures, Bioimplants
Manufacturing - Additive Manufacturing & Digital Twin	
Metallurgical and Materials Engineering	Mechniacal Metallurgy, Automotive Materials, Composites, Physical Metallurgy, Fatigue and Fracture behaviour of Materials, Structure Property corelation, High Temperatrure materials
	Shape Memory Alloys, Structural and Functional Materials, Composites, Powder Metallurgy, Automotive Materials, Microstructural Designing, Mechanical Metallurgy
	Physical metallurgy, Processing-structure-property correlation of materials, Alloy design and development, High entropy alloys, Materials for High Temperature applications, Insitu composites, Al alloy based composites, Mechanical Behaviour of materials
	High temperature materials, Automotive materials, Structure-property co-relation in advanced materials, physical metallurgy, mechanical metallurgy
	Additive Manufacturing (3D Printing), High Temperature Refractory Alloys, Nuclear Materials, Ceramics and Metallic Printing for Defence and Aerospace Application, Graphene/Graphite, Machine Learning and its Application in Extraction of Energy-Critical Elements
	Mg-Al alloys and composites, Light Metal alloys, casting, ambient and elevated temperature mechanical properties, electrochemical corrosion behaviour, physical metallurgy, mechanical metallurgy.
	Microstrucure and mechanical behavior of alloys, Deformation behavior, Structure-property correlation, High temperature materials, Solidification, Oxidation, Strengthening mechanisms, Nano-eutectic composites, High entropy alloys, Carbon Steel and alloy steel

	Light metal alloys, Steels, Bio-Materials, Alloy Design, and Development, Microstructural Characterization, Texture analysis, Deformation studies, Corrosion studies, Structure-Properties correlations
	Light metal alloy and composite, High temperature properties: Creep-Fatigue, Microstructure-Microtexture-Property correlation, Corrosion.
	Ironmaking, Steelmaking, Alternate Routes of Ironmaking, Mineral Beneficiation, Inclusion Engineering, Thermodynamic Modelling, Process Optimization, Energy Exergy and Emission (E3) Optimization, Waste Heat Recovery
Physics	Experimental Condensed Matter Physics, Energy (Hydrogen generation, storage & usage; Alcohol extraction from materials; Organic dyes: spectroscopy & their applications; AI & ML in exploring physics & materials; Device design & fabrication; application of radiation, Interdisciplinary science
	Condensed Matter Physics, Quantum Computation, Computational Physics
	Holography, Condensed Matter Physics
Production and Industrial Engineering	Reverse Engineering, Rapid Prototyping, CAD/CAM, Manufacturing
	Energy Management, Composite Materials, Bio-medical Applications, Welding, Industrial Engineering
	Automation, Industry 4.0, Smart Manufacturing, Industrial Engineering and Machining
	Metal Forming, Additive Manufacturing, ICME, Machine learning, FEM, Nontraditional Manufacturing etc.
	Supply Chain Management, Inventory Control Theory, Operations Management
	Quality Control, Multi-criteria decision-making (MCDM), Protective textiles
	Welding, Non-traditional Machining, Additive Manufacturing
	Surface Coating Technologies, Micro-manufacturing, Additive Manufacturing, Conventional Machining, Materials Characterization, Smart Manufacturing
	Metal Forming and Cryo Rolling
	Industry 4.0 (Readiness Assessment, Process Visualization, Business Process Re-engineering), Smart Supply chain Management, Operations Research, Mathematical modelling of business problems, Demand forecasting
	Industrial Engineering, Welding & Machining
	advanced fusion welding, process monitoring and control, friction stir procesing, artificial intelligence
	Advanced fusion welding, process monitoring and control, friction stir procesing, artificial intelligence
	CAD/CAM, Robotics