

INDIAN INSTITUTE OF TECHNOLOGY, BOMBAY
POWAI, MUMBAI - 400 076

INFORMATION SHEET

(Faculty Advertisement No. D-26/2018-2019)

AREAS OF SPECIALIZATION

Aerospace Engineering, Biosciences and Bioengineering, Chemical Engineering, Chemistry, Civil Engineering, Computer Science and Engineering, Earth Sciences, Electrical Engineering, Energy Science and Engineering, Humanities and Social Sciences, Industrial Design Centre, Mathematics, Mechanical Engineering, Metallurgical Engineering and Materials Science, Physics, Shailesh J. Mehta School of Management, Centre for Environmental Science and Engineering, Centre of Studies in Resources Engineering, Centre for Technology Alternatives for Rural Areas, Centre for Urban Science and Engineering, Industrial Engineering and Operations Research, Systems and Control Engineering, IDP in Educational Technology (IDP-ET), IDP in Climate Studies.

<u>Aerospace Engineering</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Department is looking for candidates in all the areas of Theoretical/computational/ experimental study and technology development related to aerospace engineering, with special emphasis on Vehicle Dynamics & Control and related disciplines and Aircraft Design & Optimization. Notwithstanding the above, department would also consider applications from exceptional candidates in other areas e.g. Propulsion and Aerodynamics.
<u>Department of Biosciences & Bioengineering</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Developmental Biology, evolutionary biology, enzymology, genetics, genomics, cell/molecular biology with expertise in high-resolution microscopy, structural biology with expertise in cryo-electron microscopy, computational biology, big data analysis, bioinformatics, systems biology, physiological systems modelling, electrophysiology, cellular physiology, neuroengineering, signal processing and biomedical instrumentation. Exceptional candidates in any other areas of biosciences & bioengineering may be considered
<u>Chemical Engineering</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Reaction Engineering and Catalysis, Interfacial Science & Engineering, Transport and Separation Processes, Process Systems Engineering & Control, Food & Biochemical Engineering, Polymer and Materials, Nanotechnology, Thermodynamics, Membrane Science & Technology, Electrochemical Engineering
<u>Chemistry</u>	<u>Specializations</u>
Professor	Chemical biology of nucleic acids, Stereoselective synthesis of hetrocycles and applications to natural products, Complex carbohydrate synthesis
Associate Professor	Statistical mechanics, theory and simulation of soft matter with emphasis on chemical applications

Assistant Professor	Computational bioorganic chemistry, Organic photochemistry and photocatalysis, Total synthesis of complex natural products
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<u>Civil Engineering</u>	<u>Specialisation</u>
Professor Associate Professor	Transportation Systems Engineering, Geotechnical Engineering, Water Resources Engineering, Structural Engineering, Ocean Engineering, Remote Sensing applications in Civil Engineering, Construction Technology and Management
Assistant Professor	<p>Transportation Systems Engineering : Analysis, design and performance of highway/airfield pavements, Pavement preservation, management and rehabilitation</p> <p>Geotechnical Engineering : Rock mechanics, Environmental geotechnology, Geotechnical centrifuge Modelling, Geo-hazards</p> <p>Water Resources Engineering : Fluid Mechanics – (Experimental and theoretical studies, fluid turbulence), Computational fluid dynamics – numerical modelling, Hydraulics – (Experimental, computational, theoretical hydrodynamics, eco-hydraulics, hydraulic structures), Groundwater hydrology (Theoretical, experimental computational), Environmental fluid mechanics/ hydraulics (Pollution in aquatic system, water supply, wastewater management), Experimental hydrologist (Field measurement, instrumentation and measurements)</p> <p>Ocean Engineering : Analysis and design of fixed and floating structures, Geotechnical and foundation analysis of ocean structures Construction and operation of ocean structures</p> <p>Remote Sensing applications in Civil Engineering : Photogrammetry, Remote sensing applications, Advanced surveying (GPS/Lidar/Sonar)</p> <p>Construction Technology and Management/Structural Engineering : Advanced construction materials, Construction management</p>

<u>Computer Science & Engineering</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Any area of Computer Science & Information Technology

<u>Earth Sciences</u>	<u>Specializations</u>
Associate Professor	Isotope Geochronology Ground water Hydrology
Assistant Professor	<p>Isotope Geochronology Ground water Hydrology Micropalaeontology Sedimentology/Sedimentary Petrology Economic Geology Mineral Exploration/Mining Geology Mathematical Geology/Geostatistics Quantitative Geomorphology and GIS</p> <p>Geophysics with specialization in seismics / Seismology Geophysics with specialization in Petrophysics related to petroleum exploration Geophysics with specialization in Computational Geophysics / Geophysical modeling / Geophysical Signal processing Geophysics with specializations in Electrical/Electromagnetic methods</p>

Post: Assistant/Associate Professor

1) For Isotope Geochronology

Essential Qualifications:

- 1) Master Degree in Science (Geology) with excellent academic record.
- 2) Ph.D. in areas related to Isotope Geochronology

Desirable:

Experience in noble Gas Mass Spectrometry/IRMS/LA-ICP-MS

2) For Groundwater Hydrology

Essential Qualifications:

- 1) Master Degree in Science (Geology/Geo-physics) or any other relevant branch of engineering with excellent academic record.
- 2) Ph.D. in areas related to groundwater hydrology with emphasis on numerical modeling/simulation.

Desirable:

Proficiency to evolve field strategies for water resource management and handle field equipments

Post: Assistant Professor

3) For Micropalaeontology

Essential Qualifications:

- 1) Master of Science Degree in Geology with excellent academic record.
- 2) Ph.D. in Micropalaeontology with specialization in Foraminifera

Desirable:

Candidate should have research experience in field-based and stratigraphic problems.

4) For Sedimentology/Sedimentary Petrology

Essential Qualifications:

- 1) Master of Science Degree in Geology with excellent academic record
- 2) Ph.D. in Sedimentology/Sedimentary Petrology

Desirable:

Experience in ichnology/sequence stratigraphy and experience in petroleum industry

5) For Economic Geology

Essential Qualifications:

- 1) Master of Science Degree in Geology with excellent academic record.
- 2) Ph.D. in Economic Geology/Ore Petrology/Geochemistry of Ore Deposits with specialization hydrothermal or magmatic ore deposits.

Desirable: Experience in fluid/melt inclusion studies.

6) For Mineral Exploration/Mining Geology

Essential Qualifications:

- 1) Master of Science Degree in Geology /B.Tech/M.Tech in mining with excellent academic record.
- 2) Ph.D. in Economic Geology/ Mining with specialization or industrial experience in Mineral Exploration/Mining Geology/Mineral Beneficiation/Geostatistics"

Desirable: Experience in Geostatistics

	<p>7) For Mathematical Geology/Geostatistics: Essential Qualifications: 1) Master of Science Degree in Geology/Geophysics/Mathematics with excellent academic record 2) Ph.D in any area of Earth Sciences/Geostatistics/Mathematics with significant application of multivariate statistical techniques, stochastic processes or geostatistics in Earth Sciences.</p> <p>Desirable: Post-doctoral work in application of statistical techniques to geoscience problems.</p> <p>8) For Quantitative Geomorphology and GIS Essential Qualifications: 1) Master of Science Degree in Geology/Geospatial Technology with excellent academic record 2) Ph.D. in quantitative Geomorphology with experience in Geospatial data management and modelling.</p> <p>Desirable: Experience in microwave remote sensing and LiDAR</p> <p>9) For all positions related to Geophysics Essential Qualifications: 1) Master of Science degree/M.Tech degree in Geophysics or fields related to Geophysics with excellent academic record 2) Ph.D. in relevant field of Geophysics</p> <p>Desirable: Industrial experience for fields related to Petroleum exploration with experience in Quantitative and/or Qualitative seismic interpretation</p>
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<u>Electrical Engineering</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Communication and signal processing, theory of control and computing, Power Electronics and Power Systems, Microelectronics and VLSI design, Electronic Systems

<u>Energy science & Engineering</u>	<u>Specializations</u>
Assistant Professor Associate Professor Professor	Energy in Buildings, Conventional Energy/IC Engines, Energy Policy, Energy Management, Process Integration, Clean Coal, Electrical Energy System, Grid Connection of Renewables, Power Electronics and Controls, Solar Thermal, Energy Efficiency, Biofuel/Bioenergy, Combustion, Wind, and Hybrid system.

<u>Humanities & Social Sciences</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	<i>Economics</i> Development Economics, International Economics, Finance, Agricultural Economics, Econometrics, Public Finance and Public Policy, Behavioural Economics, Micro and Macroeconomics Theory, Industrial Economics

	<p>English The Early Modern, Comparative Literature, Cultural Studies, Literary Theory, Literature and Other Arts, Translation Studies, Literary Modernisms, The Long 19th Century, Empire, Nation and Region, Book History, Theoretical Linguistics (particularly Semantics) and Cognitive Linguistics.</p>
	<p>Philosophy Indian Philosophy, Logic, Philosophy of Science, Political Philosophy, Ethics, Aesthetics, Cognitive Science, Analytical Philosophy, Continental Philosophy, History of Philosophy.</p>
	<p>Psychology Cognitive Psychology, Organizational Psychology/Behaviour, Social Psychology, Clinical Psychology</p>
	<p>Sociology Agrarian studies, Science Technology & Society, Quantitative research methods, Demography and society Sociology of education, Political sociology, Historical sociology, Family and kinship studies</p>
	<p>Cell for Indian Science and Technology in Sanskrit Astronomy (Jyotisha), Mathematics (Ganita), Metaphysics</p>

<u>Industrial Design Centre</u>	<u>Specializations</u>
Professor	Product Design, Mobility and Vehicle Design
Associate Professor	Communication Design, Animation, Interaction Design, Mobility and Vehicle Design
Assistant Professor	Product Design, Communication Design, Animation, Interaction Design, Mobility and Vehicle Design

<u>Mathematics</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Algebra, Algebraic Geometry, Algebraic Topology, Combinatorics, Differential Geometry, Functional Analysis, Harmonic Analysis, Number Theory, Numerical Analysis, Partial Differential Equations, Probability and Statistics.

<u>Mechanical Engineering</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	<p>The Department of Mechanical Engineering is looking for individuals with outstanding academic record for faculty positions in the following areas: Experimental and Computational Mechanics, Dynamics and Controls, Robotics, Biomechanics, Mechanics of soft matter, Tribology, Combustion process and applications, Refrigeration, Air Conditioning and Cryogenics, Nuclear Engineering, Product Design and Manufacturing focusing on CAD/CAM/CIM/PLM, Composite manufacturing processes, Manufacturing automation and control including Cyber Physical Systems and real time process control, Application of manufacturing analytics/Artificial Intelligence/Machine learning/Soft Computing and allied approaches to manufacturing.</p>

<u>Metallurgical Engineering & Materials Science</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Metallurgical Engineering and Materials Science

<u>Physics</u>	<u>Specializations</u>
Professor	Theory of electronics structure & optical properties of polymers. First Principles Electronic Structure Calculations of Novel Magnetic Systems. Magnetic and magnetotransport properties of metallic thin films. Magnetic properties of intermetallics. Electronic Structure Theory of crystalline insulators, polymers and disordered metallic alloys. Magnetism of lowdimensional spin systems and oxide materials
Associate Professor	Statistical Physics : Nonequilibrium and Biological systems. Statistical mechanics of granular materials & Polymers. Experimental Nuclear Physics (Relativistic heavy ion collisions)
Assistant Professor	Cosmology and Astro Particle Physics Theory. Nonlinear Optics, Ultra Fast Laser Spectroscopy, Photonics, Quantum Optics (All Experimental), Theoretical Quantum Optics. Nano Materials & Nano Structures. Theoretical Condensed Matter Physics (Many body theory). Nuclear Physics Theory, Experimental Nuclear & Particle Physics. Quantum Computing (Experimental). BioPhysics (Diffusion dynamics in Biosystems (Experimental), Random processes in Complex system (theory)

<u>Shailesh J. Mehta School of Management</u>	<u>Specializations</u> Areas (in bold-face are current high need areas)
Professor Associate Professor Assistant Professor	Decision Sciences & Quantitative Methods, Economics, Finance & Accounting, Information Systems, International Business, Marketing, Operations Management, Organizational Behavior & Human Resource Management, Strategic Management, Technology Management, Any other (General Management).

<u>Centre for Environmental Science & Engineering</u>	<u>Specializations</u>
Professor	Biotransformation and Toxicity Evaluation of Complex Organic Pollutants, Physicochemical and Biological Treatment Processes, Air Pollution Control, Technologies and Mitigation Strategies for Climate Change
Associate Professor	Physicochemical and Biological Treatment Processes, Environmental Systems Modelling, Analysis of hydro climatic extremes, Solid Waste Management, Climate Change and greenhouse gas mitigation
Assistant Professor	Air Quality Management – Measures and Modelling, Health and Economic Risk, Air Pollution Control, Aerosol Science and Engineering, Sustainable Development (Policies and Actions), Environmental Law, Environmental Management; Cleaner Technologies and Preventive

	Environmental Management, Microbial Ecology, Environmental Microbiology, Ecosystem Monitoring – structure and function, risk assessment, modelling response to climate change, Environmental Impact and Risk Assessment
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<u>Centre for Studies in Resources Engineering</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Oceanography, Atmospheric Remote Sensing, Water Resources, Climate Change Modeling, Snow, Glaciers, Ice studies, Natural Hazards and Disaster Management, Forestry and Ecology, Planetary Sciences, Geocomputation and Scientific Visualization, Computer Vision and image analysis for remote sensing data, Surveying and geodesy, Urban Development and Town Planning, Agricultural Engineering Special requirements : The candidate is expected to have a strong background in the use of remote sensing and geospatial tools in the domain areas of his/her expertise, and experience in mathematical modeling. The candidate should have studies mathematics subjects during his/her undergraduate (e.g. B.Sc./BE/B.Tech. Etc.) degree programs. For more information : head@csre.iitb.ac.in

<u>Centre for Technology Alternatives for Rural Areas</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	Development Studies with special emphasis on Public-Policy and Governance issues, Environmental issues such as Global Warming and Clean Development Mechanism, and also Economics and Conservation. Technology Transfer and Extension and in the Context of Regional Planning and Development. Design and implementation of Development Projects. Sociology of Science, History of Science & Technology in the context of Regional Development in India. Natural Resources Planning and Utilization : (i) Soils and Agriculture (including Horticulture, Organic Farming), (ii) Energy (including renewables), (iii) Water Resources (including Micro-Watershed) <i>Detailed description may be seen on the webpage (www.ctara.iitb.ac.in)</i>

<u>Centre for Urban Science and Engineering</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	CUSE is looking for exceptionally good candidates whose background, contributions and interests lie at the intersection of policy, planning, infrastructure and/or informatics as they pertain to urban centric solutions.

<u>Industrial Engineering &</u>	<u>Specializations</u>
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<u>Operations Research</u>	
Assistant Professor	<p>Candidates with proven research work and training in one or more areas will be considered:</p> <p>Contemporary operations management both in services (including energy, Finance, health and logistics sectors) and products (including digital products).</p> <p>Quantitative models, including data driven models for pricing and revenue management, contract design, procurement, service level planning, resource allocation, staffing and other areas.</p> <p>System Dynamics and Simulation including distributed and hybrid simulation, and simulation based optimization.</p> <p>Candidates with excellent research work and very good academic background in all other areas of Industrial Engineering and Operations Research, broadly construed, will continue to be considered.</p>

<u>Systems & Control Engineering</u>	<u>Specializations</u>
Associate Professor Assistant Professor	All areas of Systems and Control Engineering

<u>IDP in Educational Technology (IDP-ET)</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	<p>The current focus area of research of the IDP-ET is the development of pan-domain cognitive abilities. These include engineering design thinking, systems thinking, computational thinking, deductive reasoning, troubleshooting, scientific modeling, feasibility analysis, estimation, problem-posing, data representation & analysis and so on. While the focus primarily targets undergraduate students, the scope also includes thinking skills for school students or teachers.</p> <p>pedagogy and assessment for technology enhanced learning, computer supported collaborative learning, theoretical underpinnings for technology enhanced learning, educational psychology, cognitive science, human-computer interaction, design and development of AI and ICT based tools, game-based learning, virtual worlds, learning analytics, mobile learning.</p> <p>Candidates with a strong record in other areas of educational technology and related fields are also encouraged to apply.</p> <p>For more details, please see www.et.iitb.ac.in .</p>

<u>IDP in Climate Studies</u>	<u>Specializations</u>
Assistant Professor, Associate Professor, Professor	<p>The Interdisciplinary Programme in Climate Studies seeks applications from exceptional candidates, with specialization from among areas listed below, common to all levels of applicants.</p> <p>Climate science: Global and regional climate modeling, numerical weather prediction, atmospheric/ocean modeling, climate model development and improvement, climate model validation & verification, implementation of models on parallel computing systems. Process and</p>

	<p>phenomenological studies related to deep convection and rainfall, land-atmosphere-hydrological processes, surface fluxes, atmospheric thermodynamics, mesoscale cloud systems, aerosol and trace gas processes (formation and fate), aerosol, trace gas & cloud radiative balance, synoptic scale ocean/atmosphere circulation (Coupling, surface/sub surface mixing dynamics, boundary layer physics) . Inverse modelling, dynamical downscaling and bias correction, climate change assessment.</p> <p><i>Desirable:</i> Significant experience in modelling tropical and Indian atmosphere and climate, experience in field expeditions and big data analysis.</p> <p>Climate Policy: Vulnerability and Adaptation assessment, climate change mitigation, coastal vulnerability, vulnerability and adaptation in specific sectors (agriculture, industry, transport, energy, coastal), Carbon Capture and Sequestration, climate change impacts, economics of climate change, climate justice and ethics, climate change and migration, climate governance and action plans, climate uncertainty, climate negotiations, decentralized climate policies, climate change and regulations, climate resilience, climate and urban planning.</p> <p><i>Desirable:</i> Significant experience in methods and techniques of vulnerability and adaptation assessment, tools and techniques in policy / mitigation related research.</p>
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