

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

INFORMATION SHEET

(Faculty Advertisement B-9/2016-2017)

**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)

<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 &amp; Bioengineering</u>	<u>Specializations</u>
Professor	No specific area
Associate Professor	Mechanobiology and Cell biophysics; Biomolecular NMR spectroscopy and Structural biology; Evolution and biology of DNA virus; Protein crystallography and Structural enzymology; Biomaterials and Microfabrication for Tissue Engineering; Microfluidic Devices and Biosensors; Computational biology and Biophysics; Bacterial pathogenesis and Host-pathogen interactions
Assistant Professor	No specific area

<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>
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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

<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, <b>Construction Technology and Management</b>
Assistant Professor	<p><b>Transportation Systems Engineering</b> : Analysis, design and performance of highway/airfield pavements, Pavement preservation, management and rehabilitation</p> <p><b>Geotechnical Engineering</b> : Rock mechanics, Environmental geotechnology, Geotechnical centrifuge Modelling, Geo-hazards</p> <p><b>Water Resources Engineering</b> : 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><b>Ocean Engineering</b> : Analysis and design of fixed and floating structures, Geotechnical and foundation analysis of ocean structures Construction and operation of ocean structures</p> <p><b>Remote Sensing applications in Civil Engineering</b> : Photogrammetry, Remote sensing applications, Advanced surveying (GPS/Lidar/Sonar)</p> <p><b>Construction Technology and Management/Structural Engineering</b> : Advanced construction materials, Construction management</p>

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

<u>Earth Sciences</u>	<u>Specializations</u>
<b>Associate Professor</b>	Isotope Geochronology Ground water Hydrology
<b>Assistant Professor</b>	Isotope Geochronology Ground water Hydrology Micropalaeontology Sedimentology/Sedimentary Petrology Economic Geology Mineral Exploration/Mining Geology

Mathematical Geology/Geostatistics  
Quantitative Geomorphology and GIS

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

**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.

	<p><b>6) For Mineral Exploration/Mining Geology</b>  <b>Essential Qualifications:</b>  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"</p> <p><b>Desirable:</b> Experience in Geostatistics</p> <p><b>7) For Mathematical Geology/Geostatistics:</b>  <b>Essential Qualifications:</b>  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><b>Desirable:</b> Post-doctoral work in application of statistical techniques to geoscience problems.</p> <p><b>8) For Quantitative Geomorphology and GIS</b>  <b>Essential Qualifications:</b>  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><b>Desirable:</b> Experience in microwave remote sensing and LiDAR</p> <p><b>9) For all positions related to Geophysics</b>  <b>Essential Qualifications:</b>  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><b>Desirable:</b> Industrial experience for fields related to Petroleum exploration  <b>with experience in Quantitative and/or Qualitative seismic interpretation</b></p>
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<u><b>Electrical Engineering</b></u>	<u><b>Specializations</b></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 &amp; 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 &amp; Social Sciences</u>	<u>Specializations</u>
Professor Associate Professor Assistant Professor	<p><b>Economics</b> Development Economics, International Economics, Finance, Agricultural Economics, Econometrics, Public Finance and Public Policy, Behavioural Economics, Micro and Macroeconomics Theory, Industrial Economics</p> <p><b>English</b> 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><b>Philosophy</b> Indian Philosophy, Logic, Philosophy of Science, Political Philosophy, Ethics, Aesthetics, Cognitive Science, Analytical Philosophy, Continental Philosophy, History of Philosophy.</p> <p><b>Psychology</b> Cognitive Psychology, Organizational Psychology/Behaviour, Social Psychology, Clinical Psychology</p> <p><b>Sociology</b> Agrarian studies, Science Technology &amp; Society, Quantitative research methods, Demography and society Sociology of education, Political sociology, Historical sociology, Family and kinship studies</p> <p><b>Cell for Indian Science and Technology in Sanskrit</b> 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
<b><u>Mathematics</u></b>	<b><u>Specializations</u></b>
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.
<b><u>Mechanical Engineering</u></b>	<b><u>Specializations</u></b>
Professor Associate Professor	<b>Manufacturing Engineering</b> : Design, Modeling and Optimization of Manufacturing Processes (Casting, Forming, Machining and Welding), Precision Manufacturing, Nonconventional Manufacturing Processes, CAD/CAM/CIM and Rapid Prototyping, Automation, Micro and Nano Manufacturing, Industrial Engineering and Operations Research, Logistics, Quality and Maintenance Systems. <b>Thermal &amp; Fluids Engineering</b> : Fluid Mechanics and Fluid Power, Nuclear Engineering, Heat Transfer, Thermal Engineering, Refrigeration and Cryogenics. <b>Design Engineering</b> : Stress Analysis, Fatigue, Fracture, FEM and BEM, Kinematics, Dynamics, Control, Instrumentation, Textile Machinery, Mechatronics, Nanotechnology, MEMS, Condition Monitoring, Tribology, Acoustics, Vibration and NoiseControl, System Design.
Assistant Professor	Computational mechanics, Nuclear reactor thermalhydraulics, Computer integrated manufacturing, Refrigeration, Air conditioning and cryogenics, NEMS, MEMS and Mechatronics
<b><u>Metallurgical Engineering &amp; Materials Science</u></b>	<b><u>Specializations</u></b>
Professor Associate Professor Assistant Professor	Metallurgical Engineering and Materials Science
<b><u>Physics</u></b>	<b><u>Specializations</u></b>
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	<b>Statistical Physics</b> : 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)
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<b><u>Shailesh J. Mehta School of Management</u></b>	<b><u>Specializations</u></b> <b>Areas (in bold-face are current high need areas)</b>
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).

<b><u>Centre for Environmental Science &amp; Engineering</u></b>	<b><u>Specializations</u></b>
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

<b><u>Centre for Studies in Resources Engineering</u></b>	<b><u>Specializations</u></b>
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 <b>Special requirements</b> : 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 : <a href="mailto:head@csre.iitb.ac.in">head@csre.iitb.ac.in</a>

<u><a href="#">Centre for Technology Alternatives for Rural Areas</a></u>	<u><b>Specializations</b></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. <b>Natural Resources Planning and Utilization</b> : (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 (<a href="http://www.ctara.iitb.ac.in">www.ctara.iitb.ac.in</a>)</i>

<u><a href="#">Centre for Urban Science and Engineering</a></u>	<u><b>Specializations</b></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><a href="#">Industrial Engineering &amp; Operations Research</a></u>	<u><b>Specializations</b></u>
Associate Professor	Evolutionary games, Stochastic games and their applications. Mixed-integer programming, Convex optimization and their applications to logistics, etc.
Assistant Professor	Methodologies of Data science and Network models in the context of Industrial Engineering and Operations Research. Focused work in the applications of quantitative methods for analysis and design of engineering and service systems such as Communication networks, Health care, Infrastructure systems, Logistics, Manufacturing systems, Supply and value chains, Transportation systems and others. Focused work in contemporary themes of methodologies relevant to Industrial Engineering and Operations Research like Financial Engineering, Game theory, Optimization, Pricing and revenue management, Risk analysis, Simulation, Statistics, Stochastic control, Stochastic models, etc.

<u><a href="#">Systems &amp; Control Engineering</a></u>	<u><b>Specializations</b></u>
Associate Professor Assistant Professor	All areas of Systems and Control Engineering

<u><a href="#">IDP in Education Technology (IDP-ET)</a></u>	<u><b>Specializations</b></u>
Professor	The current focus area of research of the IDP-ET is the development of



Associate Professor Assistant Professor	<p>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 &amp; 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 <a href="http://www.et.iitb.ac.in">www.et.iitb.ac.in</a> .</p>
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