

## INDIAN INSTITUTE OF TECHNOLOGY BOMBAY POWAI, MUMBAI – 400 076

Advertisement No. G-1/2020

IIT Bombay invites applications from well qualified Indian nationals (including Persons of Indian Origins (PIOs) and Overseas Citizens of India (OCIs) and foreign nationals for faculty positions at the level of Assistant Professor (Grade I & II) in its various academic Departments, Centres, Schools and Interdisciplinary programs.

**This is a rolling advertisement. There is no last date.** Applicants can apply anytime throughout 2020.

**Reservation:** As per government of India rules, without any compromise on qualification, experience and competence. Necessary certificates must be enclosed with the application form. The GOI policy on reservation of faculty positions also includes persons with physical disability and Economically Weaker Section (EWS). For 2020, a minimum of 100 vacancies are available. Women and applicants from other under-represented categories are encouraged to apply.

**Departments:** Aerospace Engineering, Biosciences & Bioengineering, Chemical Engineering, Chemistry, Civil Engineering, Computer Science & Engineering, Earth Sciences, Electrical Engineering, Energy Science & Engineering, Environmental Science & Engineering, Humanities & Social Sciences, Mathematics, Mechanical Engineering, Metallurgical Engineering and Materials Science, Physics.

**Schools:** Shailesh J. Mehta School of Management

**Centres:** Industrial Design Centre, Centre for Policy Studies, Centre of Studies in Resources Engineering (CSRE), Centre for Technology Alternatives for Rural Areas (CTARA), Centre for Urban Science & Engineering (CUSE)

**Interdisciplinary Groups:** Industrial Engineering & Operations Research, Systems & Control Engineering, Educational Technology, Climate Studies.

### Assistant Professor Grade I

#### Qualification:

Ph.D with First class or equivalent (in terms of Grades etc.) at the preceding degree and a good academic record throughout.

#### **(Ph.D. is not required for Assistant Professor Grade I position in Industrial Design Centre)**

\*Foreign national here means a person who does not have either an Indian passport, or a PIO/OCI card. Foreign nationals can be offered contractual appointment for up to five years. The appointment can be renewed thereafter.

A minimum of three years of post Ph.D teaching/research/professional experience, excluding the experience gained while pursuing Ph.D and pre-Ph.D, is required for Assistant Professor Grade I level. Candidate also should have demonstrated research capabilities in terms of publications in reputed journals and conferences.

**Scale of Pay:** Level 12 with a basic pay of Rs. 1,01,500/- per month. On completion of 3 years of service as Assistant Professor Grade I with Academic Level 12, shall move to Academic Level 13A1 with a basic pay of Rs. 1,31,400/- pm.

*Eligible candidates with less than the requisite experience may be taken as Assistant Professor Grade II in the Academic Level 10 or 11 with appropriate pay based on post-doctoral experience.*

### **Assistant Professor Grade II**

Candidates not eligible for Assistant Professor Grade I may be appointed as Assistant Professor Grade II. At the entry level they may be placed in Academic Level 10 (basic pay of Rs. 84,700/-) and shall move to Academic Level 11 after 1 year (basic pay of Rs. 89,900/-) and 2 years (basic pay of Rs. 92,600/-). After spending 3 years in Academic Level 10 & 11 together, they will be moved to Assistant Professor Grade I in Academic Level 12.

### **Special Incentives:**

In addition to incentives which are a part of the pay package according to 7<sup>th</sup> Pay Commission norms, the following apply :

- a. To encourage early start to research until the project funding from external agencies are obtained, a seed grant of Rs. 20 Lakh is available to new faculty members who work on experimental work and substantially higher amount may be made available depending on the nature of the work. Those who need higher start up grant have to submit a detailed proposal with proper justification and a final decision will be taken by a committee appointed by the Director.
- b. The Institute provides a Cumulative Professional Development Allowance (CPDA) of Rs. 3 Lakhs for every block period of 3 years, minimum of Rs. 2 Lakhs is earmarked for presenting papers at conferences and a maximum Rs. 1 Lakh is available towards membership fee of professional bodies and contingency expenditure.
- c. A matching grant of Rs. 3 Lakhs in the block period is given from IRCC/donation funds to attend conferences, workshops, etc.
- d. Further, IRCC also provides Rs. 1 lakh over a period of 3 years to file patents on the research outcome at IIT Bombay
- e. A 'Young Faculty Award' instituted from Alumni of the Institute, to faculty joining at the Assistant Professor Grade I & II of Rs. 1.0 Lakh per year for the first 4 years after joining.
- f. Reimbursement of relocation charges of upto Rs. 1.0 Lakhs for faculty from abroad for reimbursement of air fare for self and spouse and cost of transportation of goods. Reimbursement of upto Rs. 50,000/ for self and family and transport of goods for faculty joining from within India.
- g. Outstanding candidates may be considered for "Institute Chair Assistant Professor" position which will give additional honorarium of Rs. 15,000 pm and contingency grant of Rs. 35,000 per year.

The information sheet containing full details of the areas of specialization in faculty are required and application form is available on the institute's website

<http://www.iitb.ac.in/en/careers/faculty-recruitment>

The application must be complete with full details of educational qualifications including year of obtaining Ph.D., date of defense and a detailed CV providing list of publications (with reprints of the best papers), teaching/ research/ industrial experience, date of birth along with the names and contact details of four referees.

NOTE:

1. Separate applications must be sent if a candidate is applying for a faculty position in more than one Department/Centre/School etc.
2. The candidates should be preferably below 35 years of age
3. Candidates should have an excellent academic record, good communication skills, a commitment to high quality undergraduate and postgraduate education and demonstrated ability to carryout original and creative research.
4. Foreign Nationals who are "Persons of Indian Origin" (PIO) or Overseas Citizens of India (OCI), in whose case, if selected, permission will be sought from Govt. of India before he/she can join the Institute.
5. Other Foreign Nationals, in whose case, if selected, appointment will be on a contract basis for up to 5 years subject to permission from the Govt. of India before he/she can join the Institute.
6. Political and security clearance from Ministries of External Affairs and Home Affairs is necessary in every case for individuals with foreign passports.
7. Mere fulfilment of the qualifications and experience requirement laid down does not entitle a candidate to be called for interview.
8. The Institute encourages interaction of the faculty with industry, other research and professional institutions. Consultancy is encouraged at IIT Bombay and liberal consultancy policies are in practice.
9. Facilities for research and development activities exist in all the Departments, Schools and Centres. These are being continuously modernized with contemporary equipment and services. Good facilities also exist for computing. The Institute has a well-stocked library with close to 3 lakhs volumes of books, 1.2 lakhs bound volumes of journals, 1 lakh reports, pamphlets, standards etc. and 4000 e-books.
10. A technology business incubator hosted by the Institute, called the Society for Innovation and Entrepreneurship (SINE), (<http://www.sineiitb.org>) serves to promote technology based entrepreneurship by faculty.
11. Usually, candidates called for interview will be reimbursed apex air fare within India by Economy class from the place of their residence and back by the shortest route preferably by Air India.
12. About 90% of the faculty and research staff live on the Campus. The Institute endeavours to provide suitable accommodation to all faculty. However, initially new faculty may have to stay in transit accommodation outside the campus. Every faculty quarter on campus is provided with intercom and broadband Internet access.
13. Most of the daytoday facilities are available on the Campus including two banks, a post office, a small shopping center, two schools (upto 12<sup>th</sup>standard) for children, a well-equipped 65 bed hospital, sports facilities including a swimming pool and vast playground for field games. Cultural facilities include film clubs, Classical music societies, debating and drama and a hobbies club. The Staff Club in particular is a centre of social and cultural activities.
14. The Institute may consider candidates whose areas of specialization lie outside those stated herein, provided these persons have an outstanding academic record.
15. Persons employed in Government/SemiGovernment Organization or Educational Institutions must apply through proper channel OR shall provide No Objection Certificate while applying or at the time of Interview.
16. The Institute reserves the right to fill or not to fill any or all the posts advertised.

Date: June 19, 2020

**REGISTRAR**

### Areas of Specialization

<p><b>Aerospace Engineering</b></p>	<p>All areas of Theoretical/computational/ experimental study and technology development related to aerospace engineering, with special emphasis on Dynamics &amp; Control of aerospace vehicles and related disciplines and Aircraft Design &amp; Optimization.</p> <p>Notwithstanding the above, department would also consider applications from exceptional candidates in other areas of aerospace engineering e.g. aerospace structures, aerospace propulsion and Aerodynamics</p>
<p><b>Biosciences &amp; Bioengineering</b></p>	<p>Physiological systems modelling, electrophysiology, cellular physiology, neuroengineering, signal processing and biomedical instrumentation.</p> <p>Evolutionary biology, enzymology, genetics, genomics, computational biology, big data analysis, bioinformatics, systems biology.</p> <p>Exceptional candidates in any other areas of biosciences &amp; bioengineering may also be considered</p>
<p><b>Chemical Engineering</b></p>	<ol style="list-style-type: none"> <li>1. Biotechnology and Biosystems Engineering:</li> <li>2. Catalysis and Reaction Engineering</li> <li>3. Energy and Climate Studies</li> <li>4. Materials Engineering</li> <li>5. Process Systems and Controls Engineering</li> <li>6. Transport, Colloids and Interface Science</li> <li>7. Other Frontier areas of chemical engineering</li> </ol>
<p><b>Chemistry</b></p>	<ol style="list-style-type: none"> <li>1. Medicinal chemistry [MSc (chemistry)] is a desirable qualification. However, those without MSc Chemistry shall be considered if they have a chemistry-major at least at the BSc level).</li> <li>2. Photochemistry, Electro-organic synthesis</li> <li>3. Synthetic biology</li> <li>4. Natural product isolation</li> <li>5. Total synthesis</li> </ol>
<p><b>Civil Engineering</b></p>	<p><b>Transportation Engineering:</b> Rail transportation, Air transportation, AI and ML in transportation, Transport economics and finance, Transport infrastructure planning and design, Pavement Analysis and Design.</p> <p><b>Geotechnical Engineering:</b> All basic research areas of soil mechanics and geotechnical engineering</p> <p><b>Water Resources Engineering:</b> Fluid Mechanics – (Experimental and theoretical studies); Hydraulics – (Experimental, computational); Groundwater hydrology (Theoretical, experimental, computational); Environmental fluid mechanics/ hydraulics (Eco-Hydraulics, water and wastewater Engineering)</p> <p><b>Structural Engineering:</b> Smart Structures and Systems; Structural Repairs, Rehabilitation and Retrofitting; Structural Safety, Risks and Reliability; Resilient &amp; Sustainable Structures and Infrastructure; Disaster Risk Management; Structural Health Monitoring; Vibration and Control; Shock and Impact; Earthquake Engineering and Structural Dynamics; Hybrid Simulations for Civil Structures; Structural Mechanics; Computational Mechanics; Optimization and</p>

	<p>Design of Structures; Bio-Mechanics and Bio-inspired Structures; Heritage and Masonry Structures; Composite Materials and Structures; Advanced and Sustainable Materials.</p> <p><b>Ocean Engineering:</b> Offshore Structures (Experimental, Computational); Coastal structures (Experimental, Computational); Construction and Operation of Ocean Structures; Geotechnical and Foundation Analysis of Ocean Structures (Experimental, Computational); Physical Oceanography (Theoretical, Experimental, Computational)</p> <p><b>Remote Sensing:</b> Geodesy; Photogrammetry; Geo computational systems; GNSS; LIDAR; Remote sensing applications in urban planning and analysis; Geovisualization and cartography, CyberGIS.</p> <p><b>Construction Technology and Management:</b> Corrosion, Hydration, shrinkage, Creep, Fracture in concrete, Heritage conservation, Building sciences, Automation in Construction</p>
<p><b>Computer Science &amp; Engineering</b></p>	<p>All areas of Computer Science &amp; Information Technology, especially looking to hire in the areas of Computer Architecture, Programming Languages and Compilers, Databases, Cryptography and Security, and Bioinformatics and Computational Biology.</p>
<p><b>Earth Sciences</b></p>	<p>Isotope Geochronology, Ground water Hydrology, Mineral Exploration/Mining Geology, Mathematical Geology/Geostatistics. Quantitative Geomorphology, Geophysics with specialization in Quantitative Seismic Interpretation/ Seismic Reservoir Characterization, Geophysics with specialization in Petrophysics related to petroleum exploration, Geophysics with specialization in Computational Geophysics / Geophysical modeling /Geophysical Signal processing</p> <p><b>1) For Isotope Geochronology</b>  <b>Essential Qualifications:</b> a) Master Degree in Science (Geology) b) Ph.D. in areas related to Isotope Geochronology <b>Desirable:</b> Experience in noble Gas Mass Spectrometry/IRMS/LA ICP MS</p> <p><b>2) For Groundwater Hydrology</b>  <b>Essential Qualifications:</b> a) Master Degree in Science (Geology/Geophysics) or any other relevant branch of engineering b) Ph.D. in areas related to groundwater hydrology with emphasis on numerical modeling/simulation. <b>Desirable:</b> Proficiency to evolve field strategies for water resource management and handle field equipment</p> <p><b>3) For Mineral Exploration/Mining Geology</b>  <b>Essential Qualifications:</b> a) Master of Science Degree in Geology /B.Tech/M.Tech in mining b) Ph.D. in Economic Geology/ Mining with specialization or industrial experience in Mineral Exploration/Mining Geology/Mineral Beneficiation/ Geostatistics<b>Desirable</b> : Experience in Geostatistics</p> <p><b>4) For Mathematical Geology/ Geostatistics:</b>  <b>Essential Qualifications:</b> a) Master of Science Degree in Geology/Geophysics/Mathematics, b) Ph.D in any area of Earth Sciences/Geostatistics/Mathematics with significant application of multivariate statistical techniques, stochastic processes or geostatistics in Earth Sciences. <b>Desirable:</b> Post-doctoral work in application of statistical techniques to geoscience problems.</p>

	<p><b>5) For Quantitative Geomorphology</b>  <b>Essential Qualifications:</b> a) Master of Science Degree in Geology/Geospatial Technology 2) Ph.D. in quantitative Geomorphology with experience in Geospatial data management and modelling. <b>Desirable:</b> Experience in microwave remote sensing and LiDAR</p> <p><b>6) For all positions related to Geophysics</b>  <b>Essential Qualifications:</b> a) Master of Science degree/ M.Tech degree in Geophysics or fields related to Geophysics b) Ph.D. in relevant field of Geophysics <b>Desirable:</b> Industrial experience for fields related to Petroleum exploration with experience in Quantitative and/or Qualitative seismic interpretation</p>
<p><b>Electrical Engineering</b></p>	<p>Control Systems and Computational Methods.</p> <p>Power Electronics and Power Systems (including Control and Thermal Management of Power Electronics, Electric Machine Design, Modern Aspects of Power Systems Analysis, Planning and Policy Making, Power Semiconductor Devices and their Fabrication.</p> <p>Communication Theory, Systems and Networks (especially Millimeter-Wave/Microwave Circuits, Systems &amp; Antennas, Communication Systems &amp; Hardware, Optical Communications &amp; Networks, and Quantum Communication &amp; Cryptography).</p> <p>Multimedia Signal Processing.</p> <p>Machine Learning and Big Data.</p> <p>Semiconductor Devices and Technology (including Fabrication, Characterization, Packaging, and Reliability; Optoelectronics (Sensors), Quantum Technologies and Applications; Quantum Materials and Devices; Power Semiconductor Devices; Bioelectronic/Biomimetic Devices, Energy Conversion and Storage; Oxide Electronics and MEMS/NEMS).</p> <p>Analog/Mixed-signal/RF Integrated Circuit and System Design.</p> <p>Digital System Design, Test and Manufacturing (System-on-Chip, DFM, Computer Architecture &amp; Hardware, and Algorithm-to-Chip Level Design).</p> <p>Candidates with an exceptional academic and research record in the field of Electrical Engineering, outside the above mentioned areas, will be also considered.</p>
<p><b>Energy Science &amp; Engineering</b></p>	<p>Energy in Buildings, Conventional Energy/IC Engines, Energy Policy, Energy Management and Efficiency, Micro Energy Harvesting, Process Integration, Clean Coal, Electrical Energy System, Grid Connection of Renewables, Power Electronics and Controls, Solar</p>

	<p>Thermal (optics), Si Photovoltaic, Biofuel/Bioenergy, Combustion, Wind, and Hybrid System, Energy Storage, and Electric Mobility.</p> <p>Candidates with strong academic credentials with background in any other energy-related areas will also be considered for faculty position based on the teaching and research needs of the department.</p>
<b>Environmental Science &amp; Engineering</b>	<p>Candidates must possess Ph.D. degree with specialization in Environmental Science / Engineering from reputed Institutes with M.Tech./M.E./M.S. and B.Tech./B.E./B.S. in Civil/Chemical/Environmental Engineering, Environmental Management and allied disciplines or M.Sc. degree in Environmental Science/ Environmental Management and allied disciplines. Candidates must have consistently strong academic records throughout and should have demonstrated research expertise in one or more of the areas listed:</p> <ul style="list-style-type: none"> <li>● Microbial Ecology, Environmental Microbiology</li> <li>● Ecology, Ecosystem Monitoring</li> <li>● Environmental Impact and Risk Assessment</li> <li>● Environmental Law and Policy</li> <li>● Environmental Applications of Remote Sensing and GIS</li> </ul> <p><i>Exceptional candidates in other areas of Environmental Science &amp; Engineering are also encouraged to apply.</i></p>
<b>Humanities &amp; Social Sciences</b>	<p><b>Economics:</b> Agricultural Economics, Industrial Organization, International Trade and Finance, Labour Economics, Macroeconomics, Monetary Economics, and Public Finance</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, Print Cultures, Caste Studies, or any related area.</p> <p><b>Linguistics:</b>Theoretical Linguistics (particularly Semantic Theory, the Syntax-Semantics Interface, and Psycholinguistics)</p> <p><b>Philosophy:</b> Indian Philosophy, Logic, Philosophy of Science</p> <p><b>Psychology:</b> Cognitive psychology, organizational behaviour and social psychology</p> <p><b>Sanskrit:</b>Vyakarana</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, Economic Sociology, Migration Studies, Environmental Sociology, Urban Sociology, Labour Sociology, Sociology of Law, Sociology of Development, Sociology of Gender, Organisational Sociology, Political Economy and World Systems, Social and Political theory.</p>

<p><b>IDC, School of Design</b></p>	<ul style="list-style-type: none"> <li>• Product Design</li> <li>• Communication Design</li> <li>• Animation</li> <li>• Interaction Design</li> <li>• Mobility and Vehicle Design</li> <li>• Bionics and Design</li> <li>• System Thinking</li> <li>• Material Culture</li> <li>• Sketching and Visual Representations</li> <li>• Sustainable Product Design</li> <li>• Illustration/Drawing</li> <li>• Ceramics</li> <li>• VR/AR/New Media</li> <li>• Immersive Technologies</li> <li>• Game Design</li> <li>• Film Making</li> <li>• Automotive Styling and Design</li> <li>• Sustainable Transport</li> <li>• Smart Mobility</li> <li>• Connected Mobility</li> <li>• Human Powered Mobility</li> <li>• Sound Design and Audio Engineering</li> <li>• Mobility for Special Needs</li> </ul>
<p><b>Mathematics</b></p>	<p>Algebra, Algebraic Geometry, Algebraic Topology, Combinatorics, Differential Geometry, Functional Analysis, Harmonic Analysis, Number Theory, Numerical Analysis, Partial Differential Equations, Probability and Statistics</p>
<p><b>Mechanical Engineering</b></p>	<p>Experimental Mechanics, Dynamics and Controls, Robotics, Biomechanics, Mechanics of soft matter, Tribology, 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>
<p><b>Metallurgical Engineering &amp; Materials Science</b></p>	<p>All areas of Metallurgical Engineering and Materials Science, especially looking to hire in the following areas immediately: <b>Manufacturing</b> (Materials Joining, Additive Manufacturing, Casting, Forming, Surface Engineering); <b>Corrosion Science and Engineering</b>; <b>Process control, instrumentation and automation</b> (Metallurgical Processes, Semiconductors, Polymers, Glass and Ceramics, etc.); <b>Extractive metallurgy</b>; <b>Functional Materials and Thin Films</b> (Processing, Properties and Devices)</p>
<p><b>Physics</b></p>	<p><b>Optics: BEC/quantum optics:</b> Experimental optics with proven expertise in Quantum Optics, Bose–Einstein condensate, Ultrafast sciences.  <b>Bio Physics:</b> Experimentalists working on living-active matter with expertise in microscopy and micromanipulation techniques  <b>Astrophysics:</b> Observational and Theoretical Cosmology,</p>



	<p>Experimental Astrophysics, and Experimental Gravity</p> <p><b><u>Condensed Matter Physics (Experimental):</u></b></p> <ol style="list-style-type: none"> <li>1. Surface probing techniques such as angle resolved photoemission spectroscopy (ARPES), scanning tunneling microscopy (STM)/spectroscopy, near-field scanning optical microscopy/spectroscopy</li> <li>2. Quantum materials/technology (Expt.): Expertise in subject areas such as quantum phase transitions, topological matter, unconventional superconductivity, Majorana physics and quantum computing architectures.</li> </ol> <p><b><u>Condensed Matter Physics (Theory):</u></b> Strongly-correlated systems, disorder and/or topological aspects of quantum matter. Expertise in analytical techniques, such as many-body perturbation theory, NEGF, QFT, RG etc.</p> <p><b><u>High Energy Physics (Theory)</u></b>  Collider physics and physics beyond standard model, Perturbative QCD and theory of heavy ion physics/QGP, string theory (QFT-gravity correspondence)</p>
<p><b>Shailesh J. Mehta School of Management</b></p>	<p>Decision Sciences &amp; Quantitative Methods including Data Science  Economics Specifically Public Economics  Finance &amp; Accounting Specifically Financial  Technology/Computational Finance/Micro Finance/Financial  Inclusion/Agri Finance/Rural Finance  General Management including International Business,  Communication &amp; Business Policy and Entrepreneurial, Innovation &amp;  Project Management  Information System and Information Technology  Marketing  Operations Management Specifically Healthcare Operations and Big  Data  Organizational Behavior &amp; Human Resource Management  Strategic Management  Technology Management including Competitiveness</p>
<p><b>Centre for Policy Studies</b></p>	<p>Public Policy with particular background in:  a) Digital Societies; b) Structural Inequalities;  c) Technologies and Governance;  d) Markets and Regulatory Governance;  e) Environmental Services and Local Governance</p>
<p><b>Centre of Studies in Resources &amp; Engineering</b></p>	<p>Hyperspectral Spectroscopy and Remote Sensing; Microwave Remote Sensing and SAR Interferometry; Thermal Infrared Remote Sensing;</p> <p>Surveying and Geodesy; Geocomputation, Spatial Data Science, Geographical Information Science and Technology, Geospatial High Performance Computing, Geospatial IoT;</p> <p>Image analysis and computer vision for remote sensing data;</p> <p>Atmospheric Remote Sensing; Agricultural Engineering; Forestry and Ecology; Snow, Glaciers and Ice studies; Mineral exploration and</p>

	<p>Planetary Remote Sensing; Natural Hazards and Disaster Management; Coastal and Marine studies, Oceanography; Water Resources and Hydrology; Urban Development and Town Planning</p> <p><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. The candidate should have experience in mathematical/statistical analysis and modelling, and preferably should have studied mathematics/statistics during his/her undergraduate (e.g. B.Sc./BE/B.Tech. Etc.) degree programs. For more information : head@csre.iitb.ac.in</p>
<p><b>Centre for Technologies for Alternatives for Rural Areas</b></p>	<p>Looking for young researchers with a strong focus on Science and Technology applications towards sustainable development using concepts in the following thematic areas:</p> <p>Development, Technology, and Society  Natural Resources: Planning and Utilization (e.g., Water, Land, Agriculture, Energy)  Public Health, Food, and Nutrition  Technology Development and Dissemination  Planning and Development including Basic Services  Information Technology for Development  Global and Local Environmental Issues</p> <p>Public Policy and Governance</p>
<p><b>Centre for Urban Science &amp; Engineering</b></p>	<p>Urban design, planning, mobility, infrastructure, geography, environment, sociology, energy, data science and disaster management.</p>
<p><b>Industrial Engineering &amp; Operational Research</b></p>	<p>Candidates working in <u>all areas</u> of Industrial Engineering and Operations Research, broadly construed, are encouraged to apply. Preference will be given to the following areas:</p> <ul style="list-style-type: none"> <li>• Quantitative methods and insightful models for contemporary operations and services management, including logistics, health, energy, security, finance, pricing, contracts, service level planning, big data / business analytics.</li> <li>• Nonlinear optimisation, combinatorial optimisation, large-scale optimisation, meta-heuristics (evolutionary algorithms, swarm algorithms, etc), multi-level and distributed optimisation, data-driven/ real-time optimisation, and related areas, with applications in the broad areas of IE and OR.</li> <li>• Multi-paradigm simulation methods, agent based / discrete-event/ system dynamics methodology, distributed/ hybrid simulations, simulation-based optimisation, and related areas, with applications in the broad areas of IE and OR.</li> <li>• Network science, data science, probabilistic modeling and analysis, multi-player systems, strategic interactions among engineering systems, and related areas, with applications in the broad areas of IE and OR.</li> </ul>

<p><b>Systems &amp; Control Engineering</b></p>	<p>All areas of Systems and Control and Data Science. Candidates' teaching and research interests should have ample alignment with the interests of Systems and Control Engineering Programme</p>
<p><b>IDP in Educational Technology (IDP-ET)</b></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, and mobile learning.</p> <p>More specifically, candidates must have demonstrated research expertise, through publications or post-doctoral field experience in one or more of the following areas: Discipline based education research, STEM/STEAM/STEM-C learning, computational thinking, design thinking, psychophysiological/multimodal data analysis, educational data mining, learning analytics, assessment, teacher professional development, Learner-Centric MOOC design.</p>
<p><b>IDP in Climate Sciences</b></p>	<p><b>Climate science:</b> Global and regional climate modeling, numerical weather prediction, atmospheric/ocean modeling, climate model development and improvement, climate model validation &amp; verification, implementation of models on parallel computing systems. Process and 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 &amp; 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><b>Climate Policy:</b> 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>