

## IIT Madras - Faculty Recruitment - Specialization Areas

**Advt.No.IITM/R/1/2020 Dt.04.11.2020**

Basic qualifications and experience for the post of Assistant Professor is available in the detailed advertisement at Section A & B. In addition to the basic qualifications and experience required for eligibility, applicants are expected to have exceptional academic outputs commensurate with the post applied.

Department-wise areas of specialization sought and specific qualification requirements (if any), and are detailed in the table below:

SNo	Department	Post / Specific Qualification Requirement	Specialization Area
1	<b>Aerospace Engineering</b>	<b>Assistant Professor</b> Specific Qualification*	(i) Airplane Design (ii) Airplane Aerodynamics (experimental background preferred) (iii) Experimental structural mechanics (iv) Structural Dynamics and Aero-elasticity (v) Advanced Manufacturing of Aerospace Structures
<p>*Candidates should have clear focus in one or more of the listed areas and have aero background as detailed below:</p> <ul style="list-style-type: none"> <li>At least one degree (Bachelor's, Master's, Doctoral) in Aerospace Engineering. (OR)</li> <li>At least 3 years teaching experience in handling undergraduate / graduate level courses related to Aerodynamics / Flight Mechanics / Aircraft Propulsion / Aerospace Structures in an Aerospace Engineering department at an IIT / IIST Trivandrum / reputed university abroad. (OR)</li> <li>PhD thesis relevant to Aerospace Engineering and awarded by a university without an Aerospace Engineering department.</li> </ul>			
2	<b>Biotechnology</b>	<b>Assistant Professor</b> <hr/> <b>a)</b> BE / B.Tech in Chemical Engineering (preferably) / Biochemical Engineering / Biotechnology / equivalent	Biological Engineering with a focus on: (i) Process Development for Recombinant Therapeutics - including Cell-line Development, Process Engineering (Cell culture, Downstream Processing), Process Analytical Techniques, and Product Characterization. (ii) Synthetic biology/Metabolic engineering for the production of biofuels, platform chemicals, and specialty chemicals. (iii) Immunoengineering: Cellular, molecular, and biomaterial-based approaches (including vaccines and therapeutics) for autoimmune diseases, cancer immunotherapy, regenerative medicine, and other immunopathologies.

	<b>Biotechnology</b>	<b>b)</b> Degree in Life Sciences at the Undergraduate and PhD levels	<p>(i) Strong track-record of research experience addressing a problem that involves both basic biology and a human disease; preferably cardiovascular disease, neurobiology, infectious diseases or cancer. Desirable: Hands on experience in transgenic vertebrate animal model combining modern experimental approaches such as NGS, proteomics and genome-editing.</p> <p>(ii) Candidates with exceptional track-record in other areas of biology are also encouraged to apply.</p>
3	<b>Chemical Engineering</b>	<b>Assistant Professor</b> <ul style="list-style-type: none"> <li>At least one degree in Chemical Engineering</li> </ul>	All areas of Chemical Engineering
4	<b>Civil Engineering</b>	<b>Assistant Professor</b> <hr/> <p><b>a)</b> Bachelor's degree in Civil Engineering</p> <hr/> <p><b>b)</b> Bachelor's degree in Civil Engineering.  Outstanding candidates with demonstrated excellence in the research area, with basic degree in other allied disciplines would also be considered.</p> <hr/> <p><b>c)</b> At least one degree in Civil Engineering</p> <hr/> <p><b>d)</b> Bachelor's degree in Civil Engineering</p>	<p>(i) Infrastructure and Construction Management</p> <hr/> <p>(i) <b>Environmental Engineering:</b> Solid Waste Management, anaerobic treatment systems and Environmental Risk Analysis. Exceptional candidates in other areas of environmental engineering would also be considered.</p> <p>(i) <b>Hydraulic and water Resources Engineering:</b> Water Resources Planning and Management.</p> <hr/> <p>(i) <b>Transportation Systems:</b> Transportation Economics, Freight Transportation, Emerging Mobility Technologies (such as mobility-on-demand, electric vehicles, connected vehicles) and Traffic Safety.</p> <hr/> <p>(i) <b>Pavement Engineering and Management:</b> Nonlinear Viscoelastic/Viscoplastic Analysis of Bituminous Materials, Application of Damage Mechanics and Fracture Mechanics to Bituminous Mixtures, Reliability-Based Design Optimization as applied to Pavement Engineering, Dynamic Analysis of Pavement Structures, Design of Bituminous and Concrete Pavements, Non-destructive testing of Pavements, Road Asset Management, and Pavement Construction Technology.</p> <p>Exceptional candidates in other areas of transportation engineering would also be considered.</p>

5	<b>Computer Science &amp; Engineering</b>	<b>Assistant Professor</b> Specific Qualification <sup>#</sup>	All areas
	<b>#Computer Science &amp; Engineering:</b> <ul style="list-style-type: none"> <li>● <b>Bachelor's Degree:</b> Candidates must have an engineering degree in Computer Science and Engineering. Candidates with a Bachelor's degree in Electrical Engineering (with specialization in Electronics and Communications) or in Electronics and Communications Engineering may also apply if their records clearly demonstrate ability to teach core computer science courses.</li> <li>● <b>Master's Degree:</b> Candidates must hold a Master's degree in engineering from Computer Science/Computer Science and Engineering/Computer Engineering program. <i>[This may be waived if the candidate was admitted to a direct Ph.D. program after the Bachelor's degree.]</i></li> <li>● <b>Ph.D. Degree:</b> Must be in Computer Science / Computer Science and Engineering / Computer Engineering.</li> </ul>		
6	<b>Engineering Design</b>  <i>Bachelor's degree should be 4-year professional degree</i>	<b>Assistant Professor</b>	
		a) Bachelor's degree in Mechanical / Automobile / Engineering Design	(i) Automotive structures / Noise, Vibration and Harshness. (with demonstrated research experience during doctoral degree)
		b) Bachelor's degree in Engineering Design/Electrical/Electronics/ /Mechanical/ Biomedical Engg.	(i) Medical Device Design and development / Medical imaging (with demonstrated research experience at doctoral level and translational research experience)
		c) Bachelor's degree in Engineering Design/ Mechanical/ Production / Design	(i) Industrial design (With demonstrated research experience at doctoral level and translational research experience)
		d) Bachelor's degree in Engineering Design/Electrical/ Electronics/ Computer Science/Computer Engineering	(i) Robotic system design for field and service applications (With demonstrated research experience at doctoral level and translational research experience)
7	<b>Management Studies</b>	<b>Assistant Professor</b> <ul style="list-style-type: none"> <li>● Ph.D in Marketing / Sales Management with excellent academic record.</li> </ul>	(i) Marketing Management
8	<b>Mathematics</b>	<b>Assistant Professor</b> <ul style="list-style-type: none"> <li>● Master's degree in mathematics and Ph.D. in Mathematics.</li> </ul>	(i) Probability Theory and Mathematical Statistics (ii) Arithmetic Geometry (iii) Non-linear Analysis (iv) Representation Theory (v) Geometric Function Theory (vi) Combinatorics (vii) Mathematical Finance

9	<b>Mechanical Engineering</b>	<p><b>Assistant Professor</b></p> <ul style="list-style-type: none"> <li>At least one degree (Bachelor's /Master's / Ph.D) in Mechanical Engineering.</li> </ul> <p>Candidate must have demonstrated clearly the capability in any of the advertised areas through publications in relevant reputed journals and/or patents or products developed.</p>	<ul style="list-style-type: none"> <li>(i) Data Science with Applications in Mechanical Engineering</li> <li>(ii) Smart &amp; Additive Manufacturing</li> <li>(iii) Ultra-High Precision Manufacturing &amp; Metrology</li> <li>(iv) Robotics and Mechatronics</li> <li>(v) Sustainable Energy Generation &amp; Utilization</li> <li>(vi) Modern Mobility Systems</li> <li>(vii) Bio Mechanical Engineering</li> </ul>
10	<b>Ocean Engineering</b>	<p><b>Assistant Professor</b></p> <ul style="list-style-type: none"> <li>Ph.D relevant to Ocean Engineering with excellent academic record with engineering degree in Naval Architecture / Civil / Mechanical / Ocean Engg.</li> </ul>	<ul style="list-style-type: none"> <li>(i) <b>Naval architecture:</b> Ship structures; Ship design; Recent techniques in ship design &amp; construction; Ship machinery &amp; systems; Autonomous and Green ships.</li> <li>(ii) <b>Ocean Engineering:</b> Offshore, Harbour &amp; Coastal structures; Waterway, Port and Coastal Engineering; Geotechnical Engineering for Offshore and Coastal structures; Instrumentation in Ocean Engineering.</li> </ul>