

**IIT Madras - Faculty Recruitment - Specialization Area - (2019b)**

Advt.No.IITM/R/4/2019 dt. 23.10.2019

Please see the Section A & B of detailed advertisement for basic qualifications and experience for the posts of Professor & Assistant Professor. In addition to the basic qualification and experience required for eligibility, applicants are expected to have exceptional academic outputs commensurate with the post applied.

For Departments- the Post Advertised, specific qualification requirements (if any), and areas of specialization sought are detailed in the table below:

S No	Department	Post / Specific Qualification Requirement	Specialization Area
1	<b>Aerospace Engineering</b>	<b>Professor</b> <i>Specific Qualification<sup>1</sup></i>	(i) Interior and intermediate ballistics of guns and ammunition with focus on shock interactions and reflections (experimental)
		<b>Assistant Professor</b> <i>Specific Qualification<sup>1</sup></i>	(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><sup>1</sup>Candidates should have clear focus in one or more of the listed specialization areas and have aerospace engineering 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>• Ph.D. thesis relevant to aerospace engineering and awarded by a university without an Aerospace Engineering Department.</li> </ul>			
2	<b>Applied Mechanics</b>	<b>Professor</b>	(i) Biomedical Ultrasound imaging with emphasis on system development for diagnostics and image guidance.  (ii) Theoretical and Computational Nanofluidics.

3	<b>Bio Technology</b>	<b>Assistant Professor</b> a) Degree in life sciences at undergraduate and PhD levels.	(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.  (ii) Candidates with exceptional track-record in other areas of biology are also encouraged to apply.
		b) BE/B.Tech in Chemical Engineering (preferably) / Biochemical Engineering	Bioprocess engineering with a focus on (i) Recombinant therapeutics - including Cell-line development, Process engineering (Cell culture, Downstream Processing), Process Analytical Techniques and Product Characterization.  (ii) Synthetic biology/Metabolic engineering for production of biofuels, platform chemicals and specialty chemicals.
4	<b>Chemical Engineering</b>	<b>Assistant Professor</b>  • At least one of the degrees to be in Chemical Engineering	All areas in Chemical Engineering.
5	<b>Chemistry</b>	<b>Professor</b>  • Record of ability to teach the core physical and theoretical chemistry courses offered in the B.Tech, M.Sc. and PhD curriculum	(i) Non-equilibrium quantum field theory. (ii) Thermodynamics of molecular and ionic solutions. (iii) Stochastic reaction dynamics and polymer dynamics.
		<b>Assistant Professor</b>  • Candidates must have their basic degrees B.Sc. and M. Sc. (or M. S. as applicable) with chemistry as the major subject of study and Ph. D. degree in the field of theoretical chemistry.  • Ability to teach the core physical chemistry courses offered to our B. Tech, M.Sc. and PhD curriculum	(i) Theoretical chemistry with a strong background in quantum chemistry and spectroscopy.

6	<b>Civil Engineering</b>	<p><b>Professor</b></p> <ul style="list-style-type: none"> <li>• Specific qualification prescribed along with specialization area.</li> </ul>	<p>(i) Organization and Governance of Construction Projects. Candidate should have at least one degree in Civil Engineering</p> <p>(ii) Geotechnical Engineering. Candidate should have a Bachelor degree in Civil Engineering</p>
		<p><b>Assistant Professor</b></p> <ul style="list-style-type: none"> <li>• Specific qualification prescribed along with specialization area.</li> </ul>	<p>(i) Infrastructure and Construction Management; Candidates should have Bachelor degree in Civil Engineering.</p> <p>(ii) Building Science.</p> <p>(iii) Environmental Engineering with specialization in Solid Waste Management. Candidates should have Bachelor degree in Civil Engineering.</p> <p>(iv) Transportation Systems - Transportation Economics, Freight Transportation, Emerging Mobility Technologies (such as mobility on demand, electric vehicles, connected vehicles) and Traffic Safety. The candidate for Transportation systems should have at least one degree in Civil Engineering.</p> <p>(v) Pavement Engineering and Management - 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, Pavement Management System, Road Asset Management, and Pavement Construction Technology. The candidate for Pavement Engineering should have Bachelor degree in Civil Engineering.</p> <p>(vi) Exceptional candidates in other areas of transportation engineering would also be considered.</p>

7	<b>Computer Science &amp; Engineering</b>	<b>Professor</b> <i>Specific Qualification<sup>2</sup></i>	All areas of Computer Science and Engineering.
		<b>Assistant Professor</b> <i>Specific Qualification<sup>2</sup></i>	All areas of Computer Science and Engineering.
<sup>2</sup> <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>			
8	<b>Electrical Engineering</b>	<b>Professor</b>	(i) Control of multi-agent systems (ii) Power flow analysis incorporating renewable energy sources (iii) Hardware architectures for high performance / low power signal processing (iv) Optical Signal Processing
		<b>Assistant Professor</b>	(i) Biomedical Instrumentation with product development experience. (ii) Integrated photonics, quantum technologies.
9	<b>Engineering Design</b>	<b>Assistant Professor</b>	
		a) Either Bachelors or Masters Degree in Electrical/ Electronics/ automobile/ Mechanical/ Biomedical Engineering	(i) Sensors, Actuators, and Controls with demonstrated research experience in Automotive/Biomedical applications.
		b) Either Bachelors or Masters Degree in Electrical/ Instrumentation/ Electronics/ Biomedical/ Mechanical Engineering	(i) Medical Robotics/Medical imaging (doctoral thesis in medical imaging/medical robotics/allied areas) with translational research experience at postdoctoral level.
		c) Either Bachelors or Masters Degree in Electrical/ Electronics / Mechanical / Automobile Engineering	(i) Electric / Hybrid Vehicle Design.
		d) Either Bachelors or Masters Degree in Mechanical / Automobile Engineering	(i) Noise, Vibration and Harshness (NVH) with demonstrated research experience in Automotive applications.

10	<b>Humanities &amp; Social Sciences</b>	<b>Professor</b>	(i) Industrial Economics.
11	<b>Mathematics</b>	<b>Professor</b>	(i) Commutative Algebra. (ii) Evolutionary Game Theory.
12	<b>Mechanical Engineering</b>	<b>Professor</b> Ph D or preceding degrees in Mechanical or allied disciplines of Engineering	All areas of Mechanical Engineering.
		<b>Assistant Professor</b>  Any one degree in Mechanical Engineering	(i) Data Science with applications in Mechanical Engineering. (ii) Smart & Additive Manufacturing. (iii) Ultra High Precision Manufacturing. (iv) Robotics and Mechatronics. (v) Sustainable Energy Generation & Utilization. (vi) Modern Mobility Systems. (vii) Bio Engineering.
13	<b>Metallurgical &amp; Materials Engineering</b>	<b>Professor</b>  • At least one degree (Bachelor's/ Master's) in Metallurgical or Materials Engineering	(i) High Resolution STEM/TEM: Method Development, Simulation and Experimental Techniques.
14	<b>Ocean Engineering</b>	<b>Professor</b>  • Ph.D relevant to Naval Architecture / Ocean Engineering with excellent academic record with first degree in engineering in Naval Architecture/Civil/Mechanical /Ocean.	(i) Naval architecture: Ship structures; Motion/Maneuvering; Ship Hydrodynamics and Ship design; (ii) Ocean Engineering: Ocean structures; Marine Hydrodynamics; Ocean energy.
		<b>Assistant Professor</b>  • Ph.D relevant to Naval Architecture / Ocean Engineering with excellent academic record with first degree in engineering in Naval Architecture/Civil/Mechanical /Ocean.	(i) Naval architecture: Ship structures; Motion/Maneuvering; Ship Hydrodynamics and Ship design; (ii) Ocean Engineering: Ocean structures; Marine Hydrodynamics; Ocean energy.
15	<b>Physics</b>	<b>Professor</b>	(i) Experimental and Theoretical Condensed Matter Physics. (ii) Experimental High Energy Physics. (iii) String Theory.