

IIT Madras - Faculty Recruitment - Specialization Area - (2019a)

Advt.No.IITM/R/1/2019 dt. 15.05.2019

Please see the Section A & B of detailed advertisement for basic qualifications and experience for the posts of Associate Professor & Assistant Professor.

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	Aerospace Engineering	Associate Professor <i>Specific Qualification¹</i>	(i) Constitutive modelling and fracture studies of (textile) composites. (ii) Micro-mechanics of materials, plasticity and fracture. (iii) Immersed boundary, grid free / semi grid free methods for compressible flows.
		Assistant Professor <i>Specific Qualification¹</i>	(i) Airplane Design. (ii) Airplane Aerodynamics (experimental background preferred). (iii) Gas turbine propulsion with focus on the rotating components (turbine/compressor). (iv) Experimental structural mechanics. (v) Structural Dynamics. (vi) Advanced Manufacturing of Aerospace Structures.
<p>¹Aerospace Engineering : 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"> • At least one degree (Bachelor's, Master's, doctoral) in Aerospace Engineering (OR) • 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) • PhD thesis relevant to aerospace engineering and awarded by a university without an Aerospace Engineering Department. 			
2	Applied Mechanics	Associate Professor	(i) Post-Stall Aerodynamics. (ii) Experimental Fluid mechanics with Heat transfer application and Physics based modelling. (iii) Emerging areas of Biomedical Engineering preferably in Mechanics of Human movement with emphasis on Neural, Cognitive and Behavioural aspects.
		Assistant Professor A degree in Biomedical/ Mechanical/Chemical/Electrical/ Metallurgical / Engineering Design with Experimental Background	(i) Emerging areas of biomedical engineering preferably in Biomechanics, Biomaterials and Medical device development

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3	Bio Technology	Associate Professor	(i) Protein Folding and Dynamics.
		Assistant Professor <i>Specific qualification prescribed along with specialization area.</i>	(i) Bioprocess engineering (with specialization in cell systems engineering / synthetic biology / mammalian cell bioprocessing/downstream processing). <i>BE/BTech degree in Chemical Engg. / Biochemical Engg. / Biotechnology or equivalent.</i> (ii) Neural engineering (with specialization in brain-computer interfaces/neuroimaging). <i>Bachelor's degree in Electrical Engineering/ Computer Science /other engineering disciplines).</i> (iii) Single molecule biophysics. (iv) Basic Biomedical sciences (with specialization in transgenic vertebrate animal models involving proteomics and genome editing) <i>Ph.D. in any area of Biomedical Sciences.</i>
4	Chemical Engineering	Associate Professor <i>At least one of the degrees to be in Chemical Engineering.</i>	(i) All areas in Chemical Engineering.
		Assistant Professor <i>At least one degree in Chemical Engineering, or allied discipline relevant to advertised areas of interest.</i>	(i) Systems Biology: Human disease modeling; Host microbial interaction; Analysis of omics data, Networks & whole cells. (ii) Environment: Aerosol fate & transport;; Modeling and remediation/ restoration of environmental & ecological systems; Sensors. (iii) Energy Systems: Batteries for electric vehicles; Process engineering and development; Materials chemistry; Downstream processing.
5	Chemistry	Associate Professor <i>Bachelor's degree in Chemistry.</i>	(i) Organic chemistry with specific expertise in the area of functional organic materials.
		Assistant Professor <i>Bachelor's degree in Chemistry.</i>	(i) Experimental and theoretical physical chemistry with reference to (a) biophysical chemistry and (b) spectroscopy and dynamics. (ii) However, outstanding physical and theoretical chemistry candidates working in the following areas: electrochemistry, catalysis and advanced materials are also encouraged to apply.

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6	Civil Engineering	<p>Associate Professor</p> <p><i>Specific qualification prescribed along with specialization area.</i></p>	<p>(i) Construction Engineering and Management.</p> <p>(ii) Hydraulic Engineering. <i>Candidates should have Bachelor's degree in Civil Engineering.</i></p> <p>(iii) 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. <i>The candidate should have Bachelor's degree in Civil Engineering.</i></p>
		<p>Assistant Professor</p> <p><i>Specific qualification prescribed along with specialization area.</i></p>	<p>(i) Building Science; Construction Management</p> <p>(ii) Environmental Engineering - Solid Waste Management, anaerobic treatment systems and Environmental Risk Analysis. Exceptional candidates in other areas of environmental engineering would also be considered. <i>Candidates should have Bachelor's degree in Civil Engineering.</i></p> <p>(iii) Hydraulics and water Resources Engineering: Water Resources Planning and Management. <i>Candidate should have Bachelor's degree in Civil Engineering.</i></p> <p>(iv) (a) Transportation Systems - Transportation Economics, Freight Transportation, Emerging Mobility Technologies (such as mobility on demand, electric vehicles, connected vehicles) and Traffic Safety. <i>The candidate for Transportation systems should have at least one degree in Civil Engineering.</i></p> <p>(b) 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. <i>The candidate for Pavement Engineering should have Bachelor's degree in Civil Engineering.</i></p> <p>Exceptional candidates in other areas of transportation engineering would also be considered.</p>

S No	Department	Post / Specific Qualification Requirement	Specialization Area
7	Computer Science & Engineering	Associate Professor <i>Specific Qualification²</i>	All areas of Computer Science and Engineering
		Assistant Professor <i>Specific Qualification²</i>	All areas of Computer Science and Engineering
² Computer Science & Engineering: <ul style="list-style-type: none"> • Bachelor's Degree: 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. • Master's Degree: 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> • Ph.D. Degree: Must be in Computer Science/Computer Science and Engineering/ Computer Engineering. 			
8	Electrical Engineering	Associate Professor	(i) Organic Electronic Devices. (ii) Quantum Error Correction and Quantum Information Theory. (iii) Wireless Networks. (iv) Power System State Estimation
		Assistant Professor	(i) Theory of Nonconvex optimization Only exceptional candidates in the areas relevant to Electrical Engineering will be considered.
9	Engineering Design	Assistant Professor <i>Either Bachelor's or Master's Degree in Electrical/ Electronics / Biomedical</i>	(i) Sensors, Actuators, and Controls with demonstrated research experience in Automotive or Biomedical or Robotics applications.
		<i>Either Bachelor's or Master's Degree in Electrical/ Electronics / Mechanical / Automobile</i>	(ii) Electric / Hybrid Vehicle Design.
		<i>Either Bachelor's or Master's Degree in Mechanical / Automobile</i>	(iii) Noise, Vibration and Harshness (NVH) with demonstrated research experience in Automotive applications.
10	Humanities & Social Sciences	Associate Professor	(i) Energy and Environmental Economics (ii) Gender and Development
		Assistant Professor	(i) Science and Technology Studies
11	Management Studies	Associate Professor	(i) Operations Management
		Assistant Professor	(i) Information Systems

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12	Mathematics	Associate Professor	(i) K-Theory of Toric Varieties
		Assistant Professor	(i) Probability and Mathematical Statistics (ii) Several Complex Variables (iii) Combinatorics (iv) Representation Theory (v) Financial Mathematics (vi) Analytic Number Theory (vii) Numerical Analysis (viii) High Performance Scientific Computing
13	Mechanical Engineering	Associate Professor	(i) All areas of Mechanical Engineering
		Assistant Professor	(i) Design: a) Non-destructive Evaluation b) Meta-materials c) Robotics and control (ii) Thermal: a) Refrigeration, Air-conditioning, Cryogenics b) Experimental Turbo Machines c) Solar Thermal Energy (iii) Manufacturing: a) Measurement and Inspection in Manufacturing b) Automation in Manufacturing c) Additive Manufacturing
14	Metallurgical & Materials Engineering	Associate Professor <i>At least one degree (Bachelor's/ Master's) in Metallurgical or Materials Engineering</i>	(i) Computational Crystal Plasticity (ii) Ferrous Process Metallurgy
15	Ocean Engineering	Associate Professor <i>Ph.D relevant to Naval architecture/Ocean Engineering with excellent academic record and with first engineering degree in Naval Architecture/ Civil / Mechanical / Ocean.</i>	(i) Naval architecture: Ship structures; Motion/ Maneuvering; Ship Hydrodynamics and Ship design. (ii) Ocean Engineering: Ocean structures; Coastal Engineering; Marine Hydrodynamics.
		Assistant Professor <i>Ph.D relevant to Naval architecture/Ocean Engineering with excellent academic record and with first engineering degree in Naval Architecture/ Civil / Mechanical / Ocean</i>	(i) Naval architecture: Ship structures; Motion/ Maneuvering; Ship Hydrodynamics and Ship design. (ii) Ocean Engineering: Ocean structures; Coastal Engineering; Marine Hydrodynamics.
16	Physics	Associate Professor	(i) Semi-classical and quantum gravity. (ii) Experimental Ultrafast Physics.

Interdisciplinary areas: IIT Madras recognizes the importance of interdisciplinary areas. The candidates are encouraged to send their applications to departments in which they are best suited as well as to the virtual 'interdisciplinary' department. The candidates will be categorized as 'interdisciplinary' if (a) their research interests are in the area below and (b) such research cannot be done in one department alone.

Departments - Interdisciplinary	Post / Specific Qualification Requirement	Specialization Area
Metallurgical and Materials Engineering – Chemistry	Associate Professor	Nanomaterials for energy and environment