

List of TA & TAP topics in the following domains available for Autumn 2026 PhD admission

Research Domains

- A:** Physical & Mechanical Metallurgy;
B: Process Metallurgy & Manufacturing;
C: Structural Ceramics
D: Electronic, Magnetic and 2D Materials;
E: Energy Materials
F: Polymers & Soft Matter;
G: Corrosion & Coatings
H: Modelling & Simulation

TA topics

Faculty	Desired Qualification	Title
Abhijeet L. Sangle alsangle@iitb.ac.in	M.Sc. /M.Tech. /M.E. in Materials Science/Physics/Chemistry/Nanoscience/Nanotechnology/Electrical or Electronics and Telecommunications Engineering	Development of free-standing membranes from epitaxial thin films for various applications (Relevant to Domain D, E) Or Development of printed electronic devices from bespoke inks of functional materials (Relevant to Domain D, E)
Abhinandan Gangopadhyay abhinandan.g@iitb.ac.in	B.Tech/M.Tech in Metallurgical Engineering, Mechanical Engineering, and Engineering Physics	Characterisation of metallic materials using advanced transmission electron microscopy (Relevant to Domain A)
Amartya Mukhopadhyay amartya_mukhopadhyay@iitb.ac.in	B.Tech/M.Tech in Materials (Metallurgy, Materials, Ceramics) Science or Engineering, M.Sc. or equivalent in Physics, Chemistry, Energy Science	'Layered' transition metal oxide cathode materials for sodium ion batteries (Relevant to Domain A, E) or 'Alloying reaction' based anode materials for sodium ion batteries (Relevant to Domain A, E)
Anirban Patra anirbanpatra@iitb.ac.in	B.Tech/M.Tech./ M.Sc. in Mechanical/Materials/Aerospace Engineering	Modelling thermo-mechanical deformation during high strain rate loading (Relevant to Domain A, H)
Aparna Singh aparna_s@iitb.ac.in	B.Tech./M.Tech. in Materials Science, Metallurgy, Mechanical Engineering	Development of strong and tough steels for defence and automotive applications (Relevant to Domain A) Or Development of sustainable polymer composites for automotive applications (Relevant to Domain F)

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Arka Mandal & Ajay Singh Panwar (MEMS) arkamandal@iitb.ac.in	B.Tech./M.Tech./ M.Sc. in Metallurgical Engineering, Materials Science, Mechanical Engineering	Understanding Surface Fatigue in Ion-Irradiated Stainless Steels for Nuclear Applications (Relevant to Domain A, H)
Arup R. Bhattacharyya arupranjan@iitb.ac.in	M.Tech in Polymer, Chemical Engineering, Materials Science & Engineering, M.Sc in Physics or Chemistry	Poly(vinylidene fluoride) Based Flexible Nanocomposites for Piezoelectric Applications (Relevant to Domain F)
Aswani Yella aswani.yella@iitb.ac.in	M.Tech./M.Sc. in any discipline	Halide perovskites for optoelectronic applications (Relevant to Domain E) Or High entropy alloys for water splitting applications (Relevant to Domain E)
Avradeep Pal avradeep@iitb.ac.in	MSc in Physics, MTech in Materials Science, MTech in Electrical/Electronics engineering	Switching superconductivity using spin-orbit torque (Relevant to Domain D) Or Control of Josephson effects from a magnetized superconductor (Relevant to Domain D)
Darothi Bairagi darothibairagi@iitb.ac.in	B.Tech/ M.Tech. /M.Sc. in Metallurgy, Mechanical, Chemical, Chemistry	Understanding stress-corrosion cracking susceptibility of ultralight Mg-12Li alloy for structural applications (Relevant to Domain A, G) Or Grain boundary engineering of additively manufactured Ni-based superalloy for improved hot corrosion resistance (Relevant to Domain B, G)
Deepoo Kumar & N. N. Viswanathan deepook@iitb.ac.in	B.Tech. /M.Tech. / M.Sc. in Metallurgical Engineering, Materials Science, Mechanical Engineering	Computational thermodynamics assisted heat transfer model of continuous casting of steel (Relevant to Domain B, H) Or Effect of oxygen content in powder on defects and mechanical properties of 316L stainless steel produced using LPBF (Relevant to Domain A, B)
Jayasree Biswas biswasj@iitb.ac.in	B.E/ B.Tech./ M.E./ M.Tech. in Metallurgy, Mechanical, Chemical Engineering, Chemistry	Kinetic studies in Green Steelmaking: Refining (Relevant to Domain B) Or Critical Metals Extraction from Urban Ores (Relevant to Domain B,E)

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Karthikeyan Hariharan karthik.hariharan@iitb.ac.in	B.Tech. /M.Tech. / M.Sc. in Metallurgical Engineering, Mechanical Engineering, Materials Science	Steam side oxidation of Fe and Ni-based alloys for Advanced Ultrasupercritical steam reactors (Relevant to Domain A, G) Or High temperature oxidation and corrosion of additively manufactured and multi-principal element alloys (Relevant to Domain A, G)
M.J.N.V. Prasad mjnvprasad@iitb.ac.in	M.Tech./B.Tech. in Metallurgical/Materials/Mechanical Engineering	Development and Mechanical Behaviour of Heterostructured Metallic Materials (Relevant to Domain A)
Manish M Pande manish.pande@iitb.ac.in	B.Tech. /M.Tech. / M.Sc. in Metallurgy	Application of slag engineering to steel refining processes (Relevant to Domain B)
Mithun Chowdhury mithunc@iitb.ac.in	M.Sc. in Physics/ Chemistry, M.Tech. in Chemical Engg/ Materials Science	Rolling Liquid Crystal Droplet in a Polymeric Media (Relevant to Domain F) Or Breaking Bad: Fibril Rupture as a Universal Route to Hyperdisordered Droplet Patterns (Relevant to Domain F)
Prasanna Kumar S Mural prasannamural@iitb.ac.in	M.Tech., MSc, Any applied branch	Bio-based piezoresistive composites (Relevant to Domain F)
Shobha Shukla sshukla@iitb.ac.in	M.Sc., M.Tech. or B.Tech. in relevant discipline	Nanostructure patterning for photonic devices (Relevant to Domain D)
Smrutiranjana Parida paridasm@iitb.ac.in	MSc physics, Engg physics, M.Tech./M.E. Materials Science, Metallurgical Engineering	Carbon nanostructures synthesis by atmospheric plasma CVD (Relevant to Domain G) Or Corrosion in metal electrodes (Relevant to Domain G)
Somnath Basu somnathbasu@iitb.ac.in	B.Tech. /M.Tech. /M.Sc. in Metallurgical/Materials Engg.; Chemical and Mech. Engg. may also be suitable	Structural characteristics of environment-friendly oxide-fluoride fluxes for metal joining applications (Relevant to Domain B) Or Recycling and valorisation of solid wastes from metal production operations for environment protection (Relevant to Domain B)
Titans Dasgupta titans.dasgupta@iitb.ac.in	B.Tech. /M.Tech. / M.Sc. in Materials Science, Ceramics, Metallurgy, Mechanical, Electrical, Physics, Chemistry	Study and development of segmented thermoelectric devices for power generation (Relevant to Domain D, E) Or

		Study of thermoelectric properties of High Entropy compounds (Relevant to Domain D, E)
Vijayshankar Dandapani v.dandapani@iitb.ac.in	B.Tech. /M.Tech. in Metallurgical Engineering, Materials Science, Chemistry, Polymers, Mechanical Engineering	Hydrogen induced degradation in pipeline steels (Relevant to Domain G)
TRS Prasanna and Amrita Bhattacharya prasanna@iitb.ac.in	M.Sc. Physics / Materials Science M.Tech / B.Tech any	Role of electron-phonon interactions on structural and electronic properties of semiconductors (Relevant to Domain D)
Dipti Gupta diptig@iitb.ac.in	B.Tech. /M.Tech. in EE, Metallurgical Engineering, Materials Science, Mechanical Engineering OR MSc in Physics or Chemistry	Development of flexible RF electronic devices (Relevant to Domain D)

TAP topics

TAP Code	Title	Desired Qualification	Faculty
TAP-1	Novel AlN-based thin films for MEMS applications (Relevant to Domain D)	Materials Science/Electrical Engineering/Electronics and Telecommunications Engineering/Physics; Experience of thin film growth using sputtering or pulsed laser deposition is a plus	Abhijeet L. Sangle & Prof. Ashwin Seshia(EE) alsangle@iitb.ac.in
TAP-2	Advanced High Capacity Electrode Materials for Indigenous Sodium ion Batteries (Relevant to Domain B, E)	Materials Science/Engineering and related areas (including metallurgy), Electrochemistry, Chemistry, Physics, Ceramics	Amartya Mukhopadhyay amartya_mukhopadhyay@iitb.ac.in
TAP-3	Single photon emission in planar materials (Relevant to Domain D, H)	From Physics, Computation, Materials Science	Amrita Bhattacharya b_amrita@iitb.ac.in
TAP-4	Modelling the deformation of multi-principal element alloys (Relevant to Domain A, H)	B.Tech/M.Tech./ M.Sc. in Mechanical/Materials/Aerospace Engineering	Anirban Patra anirbanpatra@iitb.ac.in
TAP-5	Transpassive corrosion and environmentally assisted cracking of Fe and Ni-based alloys (Relevant to Domain A, G)	B.Tech./M.Tech. in Metallurgical Engineering, Materials Science, Mechanical Engineering, Chemical Engineering, Electrochemistry, Chemistry	Karthikeyan Hariharan karthik.hariharan@iitb.ac.in
TAP-6	Optimization of Ca treatment in critical steel grades (Relevant to Domain B)	B.Tech./M.Tech. in Metallurgy	Manish M Pande manish.pande@iitb.ac.in
TAP-7	Enhancing reducing efficiency of metal oxide reduction for "green" steel production	B.Tech./M.Tech. in Metallurgical/Materials	Somnath Basu, Manish M. Pande, Ajay S. Panwaar, I. Samajdar

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	(Relevant to Domain B)	Engg.; Chemical and Mech. Engg. may also be suitable	somnathbasu@iitb.ac.in
TAP-8	MOCVD synthesis of layered MoO ₃ for opt (Relevant to Domain D)	B.Tech./M.Tech. in MSc Physics, BTech/MTech Materials Science	Tanushree Choudhury tanuhc@iitb.ac.in
TAP-9	Recycling of spent Li-ion batteries - Critical metals extraction (Relevant to Domain B, E)	B.E/ B.Tech./ M.E./ M.Tech. in Metallurgy, Mechanical, Chemical Engineering, Chemistry, Physics, Energy Science	Jayasree Biswas, Amartya Mukhopadhyay biswasj@iitb.ac.in

NOTE:

Please note that the topics (i.e., other than the TAP topics), as in the department website (<https://www.iitb.ac.in/mems/en/phd-admission>), which do not have any code, are TA topics available for this round of admission. You do not have to give any preference for TA topics in the preference(s) sheet (a Google link, to be circulated) for the research topic/domain, but for TAP projects available.

We do not advertise separate topics for candidates who applied under FA/SW/EX/CT/PS categories, while they will be interviewed under their chosen research domain. Upon successful interview, in case the candidate is offered admission in any of those categories, they can decide research topic and guide (faculty) after mutual discussion and interests. In case if you have already had a discussion with any of the faculty members in MEMS department, you are welcome to indicate the name of the faculty while filling out the 'preference Google form'.

Shortlisted candidates will get an email containing the link to the 'preference Google form' to give a choice of TAP topics available for this admission round. The Google form will be sent to the email ID used in the original application form.

While filling out the Google form,

(a) Interested TA/RA/SF candidates can choose a maximum of two TAP topic choices(s) and those may preferably be relevant to the chosen research domain. Make sure that your technical background, expertise and degree(s) meet the eligibility criteria set by PI of the TAP and have relevance to the topic.

(b) Because of differences in the admission process for each category, it is not possible to entertain any request for changing the category (for example, TA to TAP, TAP to TA, FA/SW/EX/CT to TA/TAP) at any stage after getting admitted. Suggested to read the guidelines mentioned in the Institute information brochure (https://acad.iitb.ac.in/files/Ph.D._Brochure_2025_26.pdf). Since there are no RA seats in this round of admissions, the candidates who applied for RA category will be considered under TA category.