

Ph.D. Admission

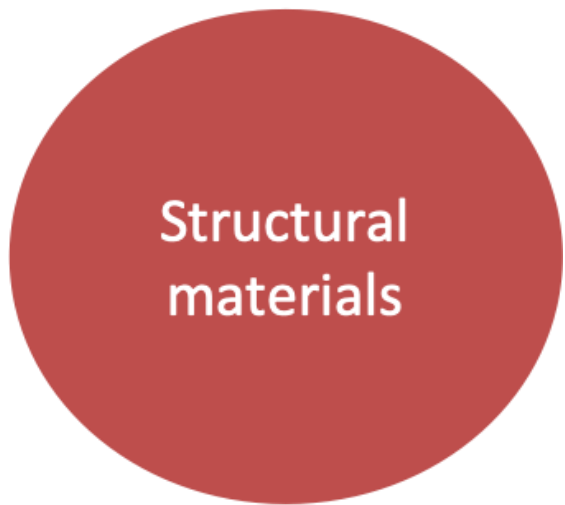
Materials Science &
Metallurgical Engineering

<https://msme.iith.ac.in/>

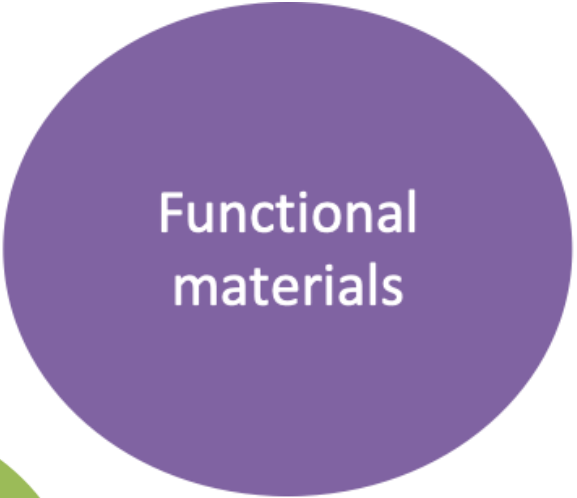


IIT Hyderabad





Structural materials



Functional materials



Characterization



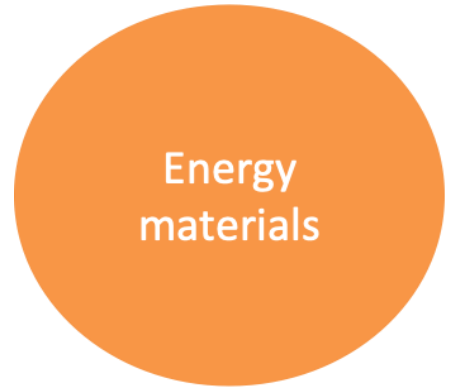
Computational



Health care &
Bio-Materials



Nanoscience &
Nanotechnology



Energy materials

MSME

Research areas

Facilities at MSME

Material Synthesis and Processing

- Pulse Laser Deposition
- E-beam deposition
- Planetary Ball mill
- Rolling mill
- Robotic welding
- Uniaxial Compaction Press
- Cold-Isostatic Press
- Induction-melting furnace
- Arc-melting furnace
- Glass vacuum sealing
- Spin and Dip coater
- Sputtering
- Hot press
- High Temperature Vacuum Furnace
- Infra-red heating furnace
- Muffle and tube furnaces
- Salt-bath furnace
- Autoclave Ovens
- Incubator shaker
- Freeze drier
- Bio-safety cabinet
- Glove-box

Computational

- Thermocalc
- DICTRA
- TC-Prisma

Characterization

- Cold FEG-TEM
- FEG- SEM with EBSD
- Optical Microscopes
- FIB
- Ion-milling, PIPS
- SPM
- Surface area and porosity analyser
- Powder & thin film XRD
- UV visible spectrophotometer
- Raman spectrometer
- DTA, DSC, TGA, Dilatometer
- Universal testing machine (MTS, Instron)
- Creep Testing
- Hardness Tester
- Wear (Pin-on-disk)
- Nanoindentor
- Electrochemical analyzer
- Viscometer



MSME Faculty

Prof. B. S. Murty

- Nanocrystalline materials
- Thermodynamics & kinetics of phase transformations
- High entropy alloys
- Bulk metallic glasses
- TEM and atom probe tomography

bsm@msme.iith.ac.in +91 (40) 2301 6001



Prof. Pinaki P. Bhattacharjee

- High entropy alloys
- Thermomechanical processing of novel alloys
- Bulk ultrafine & nanostructured materials produced by severe plastic deformation processes
- Crystallographic texture
- Mechanical behavior of materials

pinakib@msme.iith.ac.in +91 (40) 2301 6551



Prof. G.D. Janakiram

- Welding
- Additive manufacturing

jram@msme.iith.ac.in +91 (40) 2301 6565



Prof. Bharat B. Panigrahi

- Powder Metallurgy & Sintering Mechanisms
- High Entropy Alloys, MAX Phases and MXene,
- Advanced ceramics & composites
- Microstructure-Mechanical Properties of Steels
- Metal Additive Manufacturing,
- Electro-Spark Coating, Wear & Tribology

bharat@msme.iith.ac.in +91 (40) 2301 6555



Prof. Suhash R. Dey

- Advanced Multi-Functional Nanostructured Materials/High Entropy Alloys
- Combinatorial Alloy Design of emerging materials (Co-Cu-Fe-Ni-Zn High Entropy Alloys, CIGS & CZTSSe solar photovoltaics, Additive Manufactured Binary & Ternary Ti-based Biomaterials, IFHS Steel) through combined computational (DFT) and experimental techniques (electrodeposition, powder metallurgy, ink jet print)

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MSME Faculty

Dr. Ranjith Ramadurai

- Multiferroic oxide thin films for fundamental science and functional device applications
 - High-k dielectric thin films for CMOS technology and memory device applications
 - Surfaces and Interfaces of oxide hetero structures on silicon and single crystalline oxide substrates
 - Influence of process conditions, strain engineering and interface engineering on domains and domain dynamics of multiferroic thin films utilizing scanning probe microscope
- ranjith@msme.iith.ac.in +91 (40) 2301 6553



Dr. Atul S. Deshpande

- Nanoparticle synthesis and self-assembly, sol-gel processes, templating techniques
 - Novel nanostructured materials for advanced applications including catalysis
 - SOFC, ferroelectric materials
 - Bone replacement materials and drug delivery systems
- atuldeshpande@msme.iith.ac.in +91 (40) 2301 6554



Dr. Saswata Bhattacharya

- Phase transformations in alloys and oxides
 - Phase-field modelling of microstructural evolution
 - Modelling deformation of materials using discrete dislocation dynamics and continuum crystal plasticity
 - Microstructure-property correlations
- saswata@msme.iith.ac.in +91 (40) 2301 6556



Dr. Mudrika Khandelwal

- Bacterial cellulose and other natural materials- understanding structure, mechanism and applications
 - High performance green composites, liquid crystals and self-assembly of rod-like entities
 - Drug Delivery, strategies for developing anti-fouling and anti-microbial materials
 - Materials for tissue scaffolding.
- mudrika@msme.iith.ac.in +91 (40) 2301 6557



MSME Faculty

Dr. Subhradeep Chatterjee

- Phase Transformations and Microstructure Development
- Laser and Electron Beam Processing
- Welding and Surface Treatment
- Modelling and Simulation,(Phase Field/FEM/CVM)

subhradeep@msme.iith.ac.in +91 (40) 2301 6558



Dr. Rajesh Korla

- Deformation at room temperature
- Creep and super-plasticity
- Micro mechanical deformation
- Molecular dynamic simulations
- Nano indentation

rajeshk@msme.iith.ac.in +91 (40) 2301 6559



Dr. Sairam K. Malladi

- In situ characterization and technique development using MEMS devices (lab on chip)
- Phase transformations in materials, Electrochemistry and Corrosion
- In situ TEM and Graphene based super capacitors, Materials for Energy Applications

srkm@msme.iith.ac.in +91 (40) 2301 6560



Dr. Shourya Dutta Gupta

- Plasmonics and Nanophotonics
- Sensors, Lab-on-a-chip devices, Microfluidics
- Alternative materials for plasmonics
- 2D Materials based opto-electronics

shourya@msme.iith.ac.in +91 (40) 2301 6561



MSME Faculty

Dr. Chandrasekhar Murapaka

- Spintronic based memory and logic devices
- Nanomagnetic materials, Domain wall dynamics in ferromagnetic networks
- Spin torque nano-oscillators for RF applications
- Spin-orbit torque induced magnetization switching and dynamics, Magnetic tunnel junctions
- Micro and Nanofabrication techniques

mchandrasekhar@msme.iith.ac.in +91 (40) 2301 6562



Dr. Mayur Vaidya

- Diffusion-Deformation correlations in materials
- Phase growth and interdiffusion kinetics in thermoelectric materials
- Diffusion in multicomponent alloys
- Processing, characterization and stability of nanocrystalline alloys

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Dr. Deepu J. Babu

- Nanoporous materials
- CVD, Adsorption and Membrane based gas separation applications
- Carbon nanomaterials, MOFs
- Graphene & Graphyne and other 2D materials
- Defect Engineering, Plasma functionalization

deepu.babu@msme.iith.ac.in +91 8289995143



Dr. Suresh Kumar Garlapati

- Printed electronics (transistors and CMOS logics)
- Oxide Semiconductors
- Electrolytes
- Organic electronics (transistors and chemiresistors)
- Gas sensors
- Memristors

gsuresh@msme.iith.ac.in +91 9100930553



MSME Ph.D. Programme

The Doctor of Philosophy (Ph.D.) program is for enthusiastic students, who are willing to take up challenging research problems in various areas of Materials Science and Metallurgical Engineering, as mentioned in the research profiles of the faculty members (but not limited to). New ideas, inventions and innovations are most welcome. *Specific research areas will be mentioned at the time of interview.*

Selection process



Selection will be conducted online in two rounds



Only shortlisted candidates from Round-1 of the interview will need to appear for the Round-2



Candidates selected after Round-2 of the interview will be offered Ph.D. positions.



visit www.iith.ac.in for more information and apply online



Contact details

Dr. Deepu J. Babu

MSME Ph.D. Admissions Committee

Department of Materials Science & Metallurgical Engineering

Email: phd.admissions@msme.iith.ac.in

Eligibility & Qualifications

Candidates interested in Institute scholarship (MoE) and Candidates with external funding (DST-INSPIRE/ joint CSIR-UGC JRF QUALIFIED/ industry sponsorship/ external registrants from national research laboratories) with required qualifications (mentioned below) are highly encouraged to apply. Candidate should have one of the following qualification:

- M.Tech./ M.E. or equivalent degree in Materials Science and Engineering, Metallurgical Engineering, Ceramics, Mechanical Engineering, Manufacturing/ Production Engineering, Nanoscience, Polymer, Biomedical, and other relevant areas. OR
- Direct Ph.D. - B. Tech. / B.E. in the above disciplines with CGPA of 8.5 (Gen) and 8.0 (for all others), along with a valid GATE score. For project Ph.D. candidates, B. Tech. / B.E. in the above disciplines with CGPA of 8.0 (Gen) and 7.5 (for all others), along with a valid GATE score. The GATE criterion is not mandatory for B.Tech. or B.S. students graduating from an IIT/ IISc-B/ NIT /IISER or any CFTI.
- MSc or equivalent in Materials Science/ Physics/ Chemistry/Life Sciences or equivalent degree with valid GATE Score in relevant area or joint CSIR-UGC JRF, Inspire, qualified or equivalent exam. OR
- Candidates holding the regular position, in the Government organization and R&D Labs, who has B.Tech/B.E. or equivalent Degree with CGPA 8.0 and above, in relevant discipline and having two years of experience are eligible to apply as external Ph.D. student. GATE is not mandatory for them.