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M.Tech Admission

2021-22

Department of
Materials Science & Metallurgical Engineering



Indian Institute of Technology Hyderabad



MSME Faculty



Prof. B.S. Murty

PhD: IISc Bangalore, India

Contact: bsm@msme.iith.ac.in, +91 (40) 2301 6033

Research Interests:

- ❖ Nanocrystalline materials,
- ❖ High entropy alloys,
- ❖ Bulk metallic glasses,
- ❖ Thermodynamics and kinetics of phase transformations,
- ❖ Transmission electron microscopy and atom probe tomography



Prof. Pinaki P. Bhattacharjee

PhD: IIT Kanpur, India

Contact: pinakib@msme.iith.ac.in, +91 (40) 2301 6069

Research Interests:

- ❖ Design and development of novel high entropy alloys for advanced structural applications
- ❖ Development of light metals alloys for novel applications
- ❖ Bulk nano- and heterostructured materials by severe plastic deformation processing
- ❖ Thermo-mechanical and other advance materials processing
- ❖ Crystallographic texture
- ❖ Mechanical behavior of materials



Prof. G.D. Janakiram

PhD: IIT Madras, India

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

Research Interests:

- ❖ Welding
- ❖ Additive manufacturing



Prof. Bharat B. Panigrahi

PhD: IIT Kharagpur, India

Contact: bharat@msme.iith.ac.in, +91 (40) 2301 6032

Research Interests:

- ❖ Powder Metallurgy & Sintering Mechanisms, Metal Additive Manufacturing, Nanostructures,
- ❖ High Entropy Alloys, MAX Phases and MXene, Advanced ceramics & composites
- ❖ High temperature materials, Biomaterials
- ❖ Microstructure-Mechanical Properties of Steels
- ❖ Surface modification by Electro-Spark Deposition, Wear & Tribology



Prof. Suhash R. Dey

PhD, Paul-Verlaine Metz, France

Contact: suhash@msme.iith.ac.in, +91 (40) 2301 6096

Research Interests:

- ❖ 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)

MSME Faculty



Dr. Atul S. Deshpande

PhD: Max Planck, Potsdam, Germany

Contact: atuldeshpande@msme.iith.ac.in, +91 (40) 2301 7044

Research Interests:

- ❖ Nanoparticle synthesis and self-assembly, sol-gel processes, templating techniques
- ❖ Novel nanostructured materials for advanced applications including catalysis
- ❖ Solid oxide fuel cells (SOFC), ferroelectric materials
- ❖ Bone replacement materials and drug delivery systems



Dr. Ranjith Ramadurai

PhD: IISc Bangalore, India

Contact: ranjith@msme.iith.ac.in, +91 (40) 2301 7046

Research Interests:

- ❖ 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



Dr. Saswata Bhattacharya

PhD: IISc Bangalore, India

Contact: saswata@msme.iith.ac.in, +91 (40) 2301 7107

Research Interests:

- ❖ 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



Dr. Mudrika Khandelwal

PhD: Cambridge, UK

Contact: mudrika@msme.iith.ac.in, +91 (40) 2301 7118

Research Interests:

- ❖ 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.



Dr. Subhradeep Chatterjee

PhD: IISc Bangalore, India

Contact: subhradeep@msme.iith.ac.in, +91 (40) 2301 8442

Research Interests:

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

MSME Faculty



Dr. Sairam K. Malladi

PhD: TU Delft, Netherlands

Contact: srkm@msme.iith.ac.in, +91 (40) 2301 7003

Research Interests:

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



Dr. Rajesh Korla

PhD: IISc Bangalore, India

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

Research Interests:

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



Dr. Shourya Dutta Gupta

PhD: EPFL, Switzerland

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

Research Interests:

- ❖ Nanophotonics, Plasmonic nanostructures and nanoparticles
- ❖ Metamaterials and metasurfaces, Sensors, Alternative materials for plasmonics
- ❖ Alternative fabrication techniques, Nano-optical biosensors
- ❖ Graphene based devices, Lab-on-a-chip based optical devices, Microfluidic devices



Dr. Chandrasekhar Murapaka

PhD: NTU Singapore

Contact: mchandrashkar@msme.iith.ac.in, +91 (40) 2301 6562

Research Interests:

- ❖ 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



Dr. Mayur Vaidya

PhD: IIT Madras, India

Contact: vaidyam@msme.iith.ac.in, +91 (40) 2301 6564

Research Interests:

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

MSME Faculty



Dr. G. Suresh Kumar

PhD: TU Darmstadt, Germany

Contact: gsuresh@msme.iith.ac.in, +91 (40) 2301 7003

Research Interests:

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



Dr. Deepu Babu

PhD: TU Darmstadt, Germany

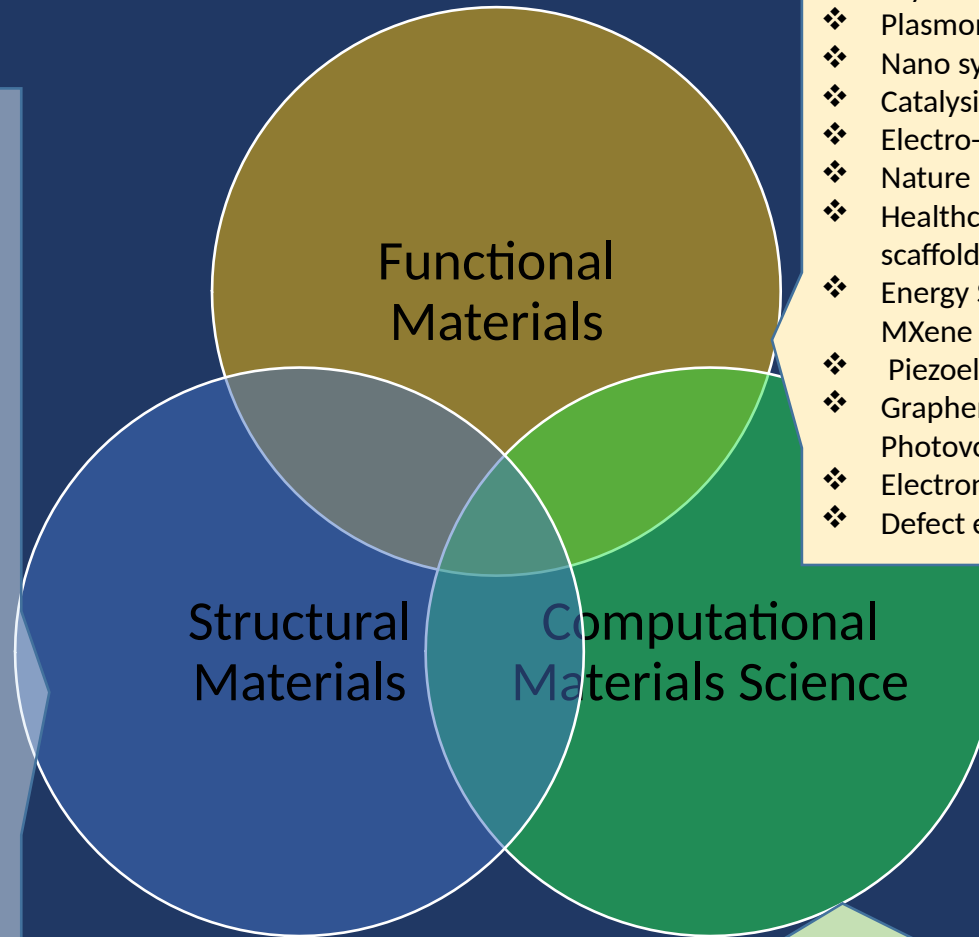
Contact: deepubabu@msme.iith.ac.in, +91 (40) 2301 6562

Research Interests:

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

Research Areas - MSME

- ❖ Grain Boundary Engineering
- ❖ Mechanical Behaviour, Plastic Deformation
- ❖ Phase Transformation, solidification
- ❖ Metals and Alloys: High Entropy Alloys, Multi-Phase Alloys, Titanium Alloys, Superalloys, Steels, Dispersion Strengthened Alloys
- ❖ Bulk-Metallic Glasses, In-situ Composites
- ❖ Metallurgical Thermodynamics and kinetics
- ❖ Severe Plastic Deformation
- ❖ Thermomechanical Processing, Texture
- ❖ Nanocrystalline materials, Ultra-fine microstructures
- ❖ Creep and high temperature deformation
- ❖ Powder Metallurgy, Advanced Composites, MMC
- ❖ Multicomponent Oxides, Nanoparticles, Ceramics
- ❖ Coating, Surface Science, Wear and Tribology
- ❖ Advanced microscopy
- ❖ Metal Joining, Friction Stir Welding, Additive Manufacturing
- ❖ Diffusion in pure metals and multicomponent alloys
- ❖ Mechanics of nanoporous materials
- ❖ Corrosion in bulk and nanocrystalline alloys
- ❖ Low Temperature solders



- ❖ Sensors
- ❖ Magnetic Materials, Spintronics, Magnetic Skyrmions
- ❖ Plasmonics, Nanophotonics, Micro-fluidics
- ❖ Nano synthesis, Self-assembly,
- ❖ Catalysis
- ❖ Electro-chemical deposition of functional materials
- ❖ Nature Inspired Materials
- ❖ Healthcare Materials, Drug Delivery, Tissue-scaffolds, Porous Implants and Biomaterials
- ❖ Energy Storage Materials, 2D Carbon Materials, MXene
- ❖ Piezoelectric hybrid nano composites,
- ❖ Graphene based Supercapacitors, Solar Photovoltaics
- ❖ Electronic materials
- ❖ Defect engineering for porous materials

- ❖ Phase-field Modelling, Combinatorial materials science
- ❖ Modelling Deformation Behavior Using Discrete Dislocation Dynamics,
- ❖ Continuum Crystal Plasticity
- ❖ Multi-scale Modelling of Functional Materials

Research Facilities - MSME

Materials Synthesis/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
- ❖ Hot press
- ❖ High Temperature Vacuum Furnace
- ❖ Infra-red heating furnace
- ❖ Muffle furnace
- ❖ Tube furnace
- ❖ Salt-bath furnace
- ❖ Autoclave Ovens
- ❖ Incubator shaker
- ❖ Freeze drier
- ❖ Bio-safety cabinet
- ❖ Glove-box
- ❖ Glass vacuum sealing
- ❖ Spin and Dip coater

Materials Characterization

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

Softwares

- ❖ Thermocalc
- ❖ DICTRA
- ❖ TC-Prisma

M.Tech Program (MHRD Fellowship)

Department offers 2-years program in Master of Technology in Materials Science and Metallurgical Engineering. Students get opportunity to learn various advanced level courses and carryout thesis in various cutting-edge areas.

ELIGIBILITY:

Candidates having B.E./B.Tech. or equivalent in Metallurgy/ Ceramics/ Mechanical / Production / Industrial / Plastics / Polymer/ or related discipline or M.Sc. in Materials Science/Physics/Chemistry
Valid GATE score required in MT/ME/PI/PH/CY/XE.

Contact for M.Tech Program (MoE Fellowship):

Dr. Rajesh Korla

Assistant Professor

Department of Materials Science &
Metallurgical Engineering

Email: rajeshk@msme.iith.ac.in

Phone: 9676468326

SELECTION PROCESS:

Based on GATE SCORE

APPLICATION PROCEDURE:

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

Glimpses of advanced level courses offered

- Properties of Materials
- Electron Microscopy
- Thermomechanical Processing Of Materials
- Advanced Physical Metallurgy
- Advanced Materials
- Thin Films Technology
- Advanced Materials Synthesis And Characterization
- Composite Materials
- Scientific Writing And Ethics In Research
- Materials For Green Energy
- Powder Metallurgy Manufacturing
- Introduction To Computational Methods In Materials Science
- Biomaterials- Materials In Medicine
- Polymer Science And Engineering
- Thermodynamics And Kinetics Of Materials
- Electrochemistry in Materials Science and Engineering
- Soft Materials
- Phase Transformations
- Hierarchical Nanostructured Materials
- Nature Inspired Materials Engineering
- 2D Materials: Synthesis, Characterization and Applications
- Wear & Triobology

M.Tech Program (Self-sponsored)

Department offers a new program in Master of Technology in Materials Science and Metallurgical Engineering. Students get opportunity to learn various advanced level courses in various cutting edge areas.

ELIGIBILITY:

Candidates having first class in B.E./B.Tech or equivalent in Metallurgy/ Ceramics/ Mechanical/ Production / Industrial / Plastics / Polymer or related discipline.

M.Sc. or equivalent degree in Materials Science/Physics/Chemistry or related discipline with minimum first class.

Contact for M.Tech. Program (Self-sponsored):

Dr. G. Suresh Kumar
Assistant Professor
Department of Materials Science & Metallurgical Engineering
Email: gsuresh@msme.iith.ac.in
Phone: 91009 30553

SELECTION PROCESS:

Written test (and/or) interview
GATE SCORE NOT MANDATORY

APPLICATION PROCEDURE:

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

Glimpses of the courses offered

- Properties of Materials
- Electron Microscopy
- Thermomechanical Processing Of Materials
- Advanced Physical Metallurgy
- Advanced Materials
- Thin Films Technology
- Advanced Materials Synthesis And Characterization
- Composite Materials
- Scientific Writing And Ethics In Research
- Materials For Green Energy
- Powder Metallurgy Manufacturing
- Introduction To Computational Methods In Materials Science
- Biomaterials- Materials In Medicine
- Polymer Science And Engineering
- Thermodynamics And Kinetics Of Materials
- Applications of Electrochemistry in Materials Science and Engineering
- Soft Materials
- Phase Transformations
- Hierarchical Nanostructured Materials
- Nature Inspired Materials Engineering
- 2D Materials: Synthesis, Characterization and Applications
- Wear & Tribology