



M.Tech.
Materials Science & Engineering
Materials Research Centre

Information Brochure



PROGRAMME DETAILS AND ADMISSIONS

Programme Description

Materials are at the root of man's progress in the modern world. Advances in technology today are limited by the availability of newer materials with desired properties and processing. The development of newer materials and technologies requires a thorough study of existing materials and tailor-making of new functional materials. Such a task, however, requires an integrated approach to the subject using established principles of Materials Science and Engineering. Keeping this objective in view and to provide focus and coordination for teaching, research and development, an Interdisciplinary M. Tech program in Materials Science & Engineering is offered by Materials Research Centre at MNIT Jaipur.

Aims and Objectives

- Create educational framework for dispersal of knowledge on synthesis and characterisation of materials.
- Develop analytical thought process for interpretation of results to radially improve existing and future materials technology.
- Develop critical reasoning to identify fundamental problems and creatively develop plans for problem solution.
- Follow employment based curriculum including employment opportunities at industry and academia while maintaining the ethical and social responsibilities.
- Hands on training on sophisticated analytical instruments for students to enable them as leading materials researcher for materials science and technology fronts.
- Advance with multidisciplinary methodology enabling problem solving approach with multi-access and creating human resource for future materials technology issues.

Programme Highlights

- Hands on training on analytical equipment's, computer based packages for simulating materials reliability and sustainability.
- Industry internship programs for students to get acquainted with relevant problems and industry approach to resolve them.
- Embracing wide range of materials, which includes, Electronic, structural, polymers and ceramics.

Programme Courses

Core

- Design of Materials
- Material Characterization Techniques
- Synthesis and Properties of Materials
- Material Synthesis and Characterization Lab
- Compound Semiconducting Devices
- Spectroscopic & Microscopic Techniques for Material Characterization
- Thermodynamics and Kinetics of Materials

Electives

- Colloids and Surfaces
- Biomaterials
- Ceramic Materials and Properties
- Computational Materials Engineering
- Introduction to Soft Materials
- Optoelectronic Materials and Devices
- Organic Electronics
- Polymer Science and Processing Technology
- Smart & Intelligent Materials
- Technology Transfer and Intellectual Property (IP) Commercialisation
- Advanced Ceramics
- Advanced Polymer Physics
- Degradation of Materials
- Energy Materials
- Material Processing & Microstructure Development
- Membrane Technology
- Nanomanufacturing
- Nanomaterials Technology
- Nanomechanics
- Thin Films and Surface Engineering
- Microscopy Lab
- Spectroscopy Lab
- Thin Film fabrication & Characterization Lab

Research Domains for Dissertations

- Nanomaterials Chemistry for New Materials
- Bio and Nature inspired systems
- Carbon nanostructures
- Functional nanomaterials
- Nanochemistry
- Material Science and Technology
- Condensed Matter Physics
- Transparent conducting thin film oxides
- Metal oxide doped with metal & rare earth metal
- Thermo-chemical behavior of amorphous alloys
- Gas Sensing
- Thermoelectric materials for Energy conversion
- Graphene and its composites for various applications.
- Self Assembly in Polymers
- Functional nanomaterials and Membranes
- Bio-Electronic Interfaces
- Finite Element Method
- Thermoelectric materials for Energy conversion
- Microscopy
- Nanostructured Ceramic Coatings
- Non-Equilibrium Processing of Nano Composites by Ball Milling and High Pressure Torsion
- Synthetic Organo-Fluorine Compounds
- Click Chemistry
- Green Chemistry,
- Advanced Oxidation Technique
- Heterogeneous Catalysis for Environmental Applications and Green Technology
- Engineered Nanomaterials/Composites for Electrocatalysis

Admissions

Who can apply?

Students who have qualified GATE from Science group and Engineering group are eligible to apply for admission to the programme.

- Chemistry (S508) CY
- Applied Science (S504) PH, CY, MA
- Any of the Disciplines in M.Sc. Degree (S599) PH
- Applied Electronics and Instrumentation Engineering (T104) EC
- Ceramic Engineering(T116) CH, XE
- Chemical Engineering(T117) CH
- Electrical and Electronics Engineering (T129) EC, EE
- Electrical and Instrumentation Engineering(T130) EC, EE
- Electrical Engineering(T131) EE
- Electronics and Communication Engineering(T135) EC
- Electronics and Instrumentation Engineering(T136) EC
- Electronics Engineering(T138) EC
- Engineering Physics(T141) PH, XE
- Instrumentation and Control Engineering(T150) EC, XE, IN
- Instrumentation Engineering(T151) EC, XE, IN
- Manufacturing Engineering(T155) ME
- Materials Science and Engineering(T157) MT, XE
- Mechanical Engineering(T158) ME
- Metallurgical and Materials Engineering(T160) MT, XE
- Metallurgical Engineering(T162) MT
- Metallurgical Engineering and Materials Science(T163) MT, XE
- Ceramic Technology(T204) MT, XE
- Chemical Technology(T207) CH, XE
- Electronics and Avionics(T232) EC
- Electronics and Electrical Engineering(T236) EC
- Electronics Science and Engineering(T243) EC
- Instrument Technology(T269) EC, XE, IN
- Materials Science and Metallurgical Engineering(T277) MT
- Materials and Metallurgical Engineering(T278) MT
- Polymer Engineering and Technology(T310) CH, XE
- Chemical and Bio Engineering (T334) CH, XE
- Manufacturing Technology(T355) ME
- Metallurgy and Materials Technology(T360) MT
- Optics and Optoelectronics (T364) EC, PH
- Polymer Engineering (T377) CH, XE
- Metallurgy and Materials (T386) MT
- Applied Electronics and Instruments (T389) EC, IN
- Instrumentation (T390) IN
- Instrumentation and Electronics Engineering (T 392) EC, IN
- Electrical and Electronics (T393) EC, EE
- Polymer Science and Technology(T173) CH, CY, XE
- Production Engineering(T177) ME, XE, PI
- Nanotechnology (T168) PH, XE

Course Duration

Course	Duration
Full-Time	2 Years
Part-Time	3 Years

Seat Details

Full time with assistantship	15
Full time sponsored	05
Part time sponsored	06

Industry - sponsored seats are available to support potential staff to attain M. Tech. degree in Materials Research Centre.

Placement of Earlier Batches

Batch 2020-22

Name of the student	Placement
Nisha Meena	Graduate Engineer Trainee, Arcelor Mittal Nippon Steels India Ltd.
Rashmi Jairiya	Research Scholar, MNIT Jaipur
Ravi Patel	Research Scholar, IIT Roorkee
Gaurav Saini	Fellow, Product development domain, Development Alternatives
Ravindra Sharma	Trainee Lecturer, Allen Career Institute, Kota
Vikas Sindhu	JRF at MNIT Jaipur

Batch 2019-21

Name of the student	Placement
Shivam Saraswat	Assistant Administrative Officer, AIIMS Bhopal
Kushagra Sharma	Technician, MNIT Jaipur
Mayavanshi Milankumar	JRF at MNIT Jaipur
Anju	Research Scholar, National Taiwan Ocean University
Surajit Samanta	Research Scholar, IIT Roorkee

Batch 2018-20

Name of the student	Placement
Ashish Sharma	Assistant Manager, Arcelor Mittal Nippon Steel India Limited
Rohit Yadav	Assistant Manager, Arcelor Mittal Nippon Steel India Limited
Jitendra Kumar Ghasal	Marketing Field Officer, Bhagyalaxmi Rolling Mills Pvt. Ltd.

Batch 2017-19

Name of the student	Placement
Parmanand Kumar Tyagi	Research Scholar, IIT Kanpur
Sneh Ankit	Research Scholar, Chang Gung University, Taiwan
Ritesh Gupta	Research Scholar, MNIT Jaipur
Nabarun Bera	Research Scholar, MNIT Jaipur

Batch 2016-18

Name of the student	Placement
Pradeep Kumar Kushwaha	Asst. Loco Pilot, South Eastern Railway
Ankur Singh	Indian Institute of Management Kashipur
Anuj Kumar Gupta	Tr. Supervisor, Nexion International Pvt. Ltd
Pawan Kumar Ojha	Research Scholar, IIT (BHU)
Sunil Kumar	Asst. Loco Pilot, East Coast Railway

Recruiters



Workshops and Industry Engagement

- GIAN course on “Photoelectron Spectroscopy for Material science” at MNIT Jaipur, Jaipur, India from 31-01-2022 to 04-02-2022.
- Short Term Course on Spectroscopic Techniques for Materials Characterization at online, online, online from 04-01-2021 to 08-01-2021.
- Short Term Course on Advanced nanostructured materials for sustainable energy and environmental remediation- tiny particles, big effects at MNIT, JAIPUR (JAIPUR), India from 18-12-2020 to 22-12-2020.
- International Workshop on Polymers for Energy Conversion and Storage at Malaviya National Institute of Technology, Jaipur, India from 13-12-2020 to 13-12-2020.
- Short Term Course on Nanomaterials for Environmental Applications: Characterization by Analytical Tools at MNIT, JAIPUR (JAIPUR), India from 17-11-2020 to 21-11-2020.
- Workshop on Modeling & Simulation Tools at Malaviya National Institute of Technology, Jaipur, India from 20-10-2020 to 24-10-2020.
- Workshop on Quantum Computing at Malaviya National Institute of Technology Jaipur, Jaipur, India from 24-08-2020 to 29-08-2020.
- Online Workshop on Advanced Techniques for Materials Characterization at Malaviya National Institute of Technology, Jaipur, India from 06-07-2020 to 10-07-2020.
- Workshop on AFM and STM at Malaviya National Institute of Technology Jaipur, Jaipur, India from 01-06-2020 to 05-06-2020.
- Online Workshop on Electron Microscopy at Malaviya National Institute of Technology, Jaipur, India from 25-05-2020 to 29-05-2020.
- Short Term Course on Density Functional Theory & its applications using Gaussian Software at MNIT, JAIPUR (JAIPUR), India from 24-02-2020 to 28-02-2020.

Contact Details:

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Assistant Professor

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