DEPARTMENT OF MATERIALS SCIENCE & ENGINEERING
INDIAN INSTITUTE OF TECHNOLOGY, KANPUR

PLACEMENT BROCHURE

2023-2024

GET IN TOUCH

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TABLE OF CONTENTS

HOD's Open Letter

Dear Recruiter...

Greetings from the esteemed Department of Materials Science and Engineering, Indian Institute of Technology Kanpur. We hold sincere hopes that some of our students will soon have the privilege of becoming part of your esteemed organization. Be assured that they will be nothing short of remarkable, adding substantial value to the progress of your institution.

Students graduating from Materials Science and Engineering Department at IITK undergo an intensive curriculum which includes not only extensive coursework but also practical engagement encompassing advanced laboratory work, project undertakings and thesis endeavors. Our department takes pride in offering access to globally competitive facilities of highest caliber.

This training program provides not only in-depth knowledge, but also offers students the opportunity to expand their domain of knowledge by selecting appropriate elective courses. Flexibility in selecting their course work allows students to carve a specialized career path for themselves. Apart from this, a rich campus life allows students the opportunity to take part in various extra-curricular and socially relevant activities, and develop a healthy personality.

The amalgamation of our rigorous program, in terms of training, and flexibility in terms of fine tuning their domain of expertise, aided by their freedom to express themselves, inculcates in students, an insatiable desire to learn and excel. We take pride in the fact that students from our department excel in wide spectrum of career opportunities. Students from our department are eager to step into industries, like automotive, aerospace, materials processing, iron and steel making, non-ferrous metallurgy, ceramics, health care, semiconductors and many more. With a strong foundation in mathematical and numerical methods, students of our department are also eager and capable of contributing to building software for the upliftment and knowledge creation in materials world.

While undergraduates of our department are trained to acquire basic understanding of the materials and quantitative analysis so that they can take up a wide variety of challenges offered by the recruiter, our research cadre students, M.Tech.s, BT-MTs and PhDs, are provided specialized training to take up any scientific and technical challenges for the development and utilization of new processes and materials for the future.

We are convinced that you, as a recruiter, would definitely be impressed by the quality and skills of our students, in varied programs, viz. B.Tech, M.Tech, BT-MT and PhD. I have no hesitation in asserting that you would certainly benefit by recruiting these talented and capable students, and with your help and guidance they will realize their full potential.

Finally, I, on behalf of our department as well as Institute, wholeheartedly recommend our students for successful job opportunity in your organization. These bright and young students are eager to make their mark in the world, and would make you proud, the way we take pride in them.

Prof. Kallol Mondal
Professor and Head MSE
IIT Kanpur

About Us

The department of Materials Science and Engineering at IIT Kanpur strives to prepare technologists/ engineers to develop new materials and processes for applications in industries of metal and mining, automotive, chemical, aviation, plastic, biotechnology, semiconductor solar, and energy sectors.

The department formerly, known as Metallurgical and Materials Engineering, was established in 1960. Since its inception, it has had a strong impact in providing knowledgeable manpower to meet the nation's demand in traditional metallurgy. The department has constantly reinvented to keep the IIT curriculum in pace with the state-of-the-art technologies.

The field of study in the department now encompasses the entire spectrum of extractive metallurgy, physical metallurgy, manufacturing processes, electronics and semiconductor materials, mechanical behavior of materials, powder metallurgy, process modeling, material degradation, nanomaterials, biomaterials, ceramics, composites, and computational materials engineering. This department has pioneered a unified approach for teaching and research, which has enabled us to evolve into an interdisciplinary field contributing to diverse applications and technological development.

Academic Programs

2021-22 Batch

B. Tech	BT-MT	M. Tech	PhD
309	6	45	126
4 Years	5 Years	2 Years	5 Years

MSE Department at IIT Kanpur puts emphasis on enhancing the technical expertise of the students and provides hands-on Industrial exposure to students with internships, projects, and visits.

UG Coursework

- Basic Sciences*
- Core Laboratories*
- Departmental Courses*
- Internship (2nd /3rd year)*
- B.Tech Thesis
- Teaching Assistantship
- Internship

PG Coursework

- Structure and Characterization of Materials*
- Transport Phenomena*
- Thermodynamics*
- Mathematical and Computational Methods*
- M.Tech/Ph.D Thesis*
- Teaching Assistantship*
- Internship

*compulsory

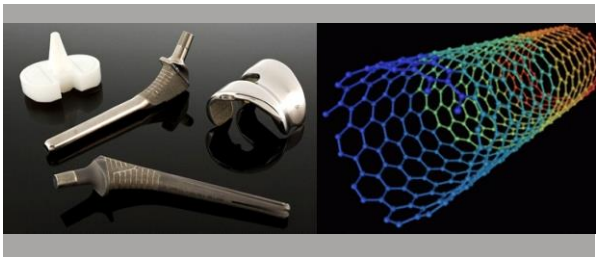
Academic Curriculum

Metallurgical Engineering

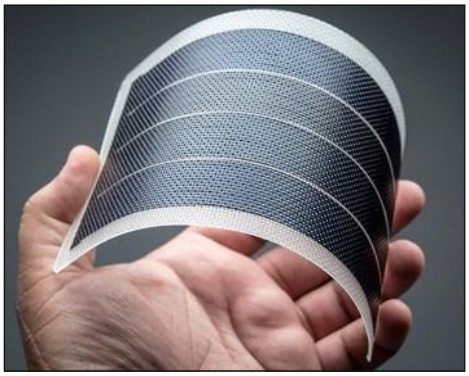
- Iron and Steel Making
- Principles of metal extraction and refining
- Phase Transformations
- Thermodynamics & Phase Equilibria
- Mechanical Behavior of Materials
- Materials Failure: Analysis and Prevention
- Structure and Characterization of Materials
- Diffusion in Solids

Biomaterials and Nanomaterials

- Introduction to Biomaterials
- Materials Science Technologies for
- Applications in Life Sciences
- TEM and Nano Analysis of Materials
- Nanostructures and Nanomaterials:
- Characterization and Properties



Electronics Materials



- Electronic Devices and Characterization
- Electro-ceramic Materials and Applications
- Computer Simulations in Materials Science and Technology of Thin Films and
- Device Fabrication
- Energy Materials and Technologies
- Materials for Semiconductor Industry
- Display Technology

Materials in Manufacturing

- Materials Processing
- Selection & Design of Engineering Materials
- Manufacturing processes
- Solidification Processing
- Heat Treatment and Surface Hardening
- Powder Metallurgy
- Introduction to Lightweight Alloys

Research Facilities

MSE department at IIT Kanpur is furnished with world-class facilities assisting students in learning vital skills and gain hands-on experience of the latest technologies used in industries and academia. Apart from the various testing and characterization laboratories, the department also houses befitting computational and modeling facilities in steelmaking, fluid dynamics, and solidification processing. We have the following labs in our department: https://iitk.ac.in/mse/MSE-Facilities/

Microstructure Characterization Facility

SEM APT	AFM	DSC/ TGA
TEM	BET	XRD
EPMA	XPS	

Physical Metallurgy and Engineering Metallurgy Lab

Optical Microscopy	Welding
Microwave Sintering Furnace	Brazing
Rolling Mill	

Electronic Materials and Thin Film Processing Lab

Pulse Laser Deposition	Clean Room
Electron-Beam Evaporation	Sputtering
Photolithography	

Material Testing Lab

UTM	Impact Testing
Fatigue Testing	Hardness Testing
Creep Testing	Microhardness Testing

Research Highlights

SAMTEL Centre for Display Technologies

To conduct R&D so as to nurture and support the growth of science and technology of electronic displays and to establish a tripartite relationship between industry, academia and governmental agencies.

National Centre for Flexible Electronics

It acts as a nodal point in India to bring academia, industry and public research organizations under one umbrella for research and development of large area flexible electronics.

Industry Partners: Applied Materials, Manipal Technologies, Chain Electronics, Mathura Manufacturing

Advanced Centre for Materials Science

Advanced Centre for Materials Science was created in 1978 with a view to make available major materials preparation and characterization facilities under one-roof. These state-of-the-art research facilities are regularly upgraded, and maintained by suitably trained competent staff.

Integrated Computational Materials Engineering

Integrated Computational Materials Engineering is a National Hub at IIT Kanpur - A Joint IITK-TCS Initiative

Centre for Nanosciences

The centre is aimed to provide various nanomission & nanotechnology related fabrication & characterization tools for fundamental research support to startups and other academic & industrial partners.

Seminar/Talks (2022-2023)

- Prof. Anuj Bisht, Loughborough University, UK, delivered a talk on "Material Phenomenon under load near theoretical stress".
- Dr. Surender Maddella, Sr. Tech. Spec., AutoE Tech Forum Chair, USA, delivered a talk on " Charting A Career Path: A glance at Research Highlights".
- 15th Professor E C Subbarao Lecture Series on “Fascinating challenges of Health Care for Engineering” delivered by Prof. Akshaya Kumar Jena, Former Professor and Head Material Science and Engineering IIT Kanpur.
- 11th Annual Samsonov Memorial International Lecture Series on “10 years of research on diffusion in high -entropy alloys” delivered by Dr. Sergiy Divinski, Professor, University of Munster, Germany

Research Themes and Areas

Research Themes

Health Care

Energy and Environment

Electronic Materials & Devices

Railways, Automobiles, Space and Defence Technologies

Iron, steel & other metals

Research Areas

- Biomaterials
- Computational Materials Science
- Electroceramics
- Extractive Metallurgy
- Flexible and Organic Electronics
- Manufacturing Processes
- Material Degradation
- Mechanical Behavior of Materials
- Nanomaterials and Nanotechnology
- Physical Metallurgy
- Powder Metallurgy
- Process Modeling
- Structural Ceramics

Projects and Collaborations

Areas of Ongoing Projects

- Steelmaking, Process Modelling
- Flexible electronics, materials and devices, semiconductor materials, Organic Electronics
- Computational Materials Science, Finite Element Method, Integrated Computational Materials Engineering
- Physical Metallurgy, Phase Transformation
- Environmental degradation of alloys
- Biomaterials, Protein Patterning
- Multi-component Diffusion, Thermodynamics
- Powder Metallurgy, Ceramic Processing, Sintering, Solid Oxide Fuel Cells
- Grain Boundary Engineering, Severe Deformation Processing
- Mechanical Behavior of Materials
- Stereology, Crystallography
- Glassy Alloys, Quasicrystals
- Nanomaterials/ Composites
- 3D and additive Manufacturing

Collaborations

Departmental Activities

Department Bodies

Indian Institute of Metals - Kanpur chapter organizes Materials Quiz workshops and conferences, involving student-faculty interaction

Materials Society(MatSoc) is an integral student community which organizes various departmental talks, workshops, events and recreational activities

Material Advantage is a window providing access to the materials professional's most eminent societies like ASM, TMS, AIST and Acers

Research Scholars Day and Farewell

Department of Materials Science and Engineering successfully organized **Padarth** Research Scholars Day 2023 (RSD23) on February 18-19, 2023. The event was meticulously planned and conducted by the Research Scholars of the department. RSD is an annual event of the department whose primary objectives are to promote scholarly discussions amongst the research scholars and also to encourage interdisciplinary research in the department. A series of outstanding technical talks were delivered by the senior research scholars of the department. Additionally, metallography contest and quizzes were organizedto enthuse the younger researchers.



The Farewell event organized by Matsoc for the passing out Y21 (PG) batch andY19 (UG) batch. The event was filled with nostalgic moments and celebrations featuring cultural performances, games and inspiring words from professors. During the event, Faculty members, students, all shared their memories and laughs with the outgoing batch and finally bided them goodbye by wishing them best of luck for their future endeavors. Also, a token of appreciation was also handed over to the graduating batch


Department Achievements

- **Dr. Kantesh Balani** has been elected as a Dean of Resources and Alumni (DORA), IIT Kanpur, Fellow of the Indian National Academy of Engineering (INAE), Fellowship of the National Academy of Sciences, India (NASI), The Yadupati Singhania Memorial Chair for a period of three years, an editorial board member of Journal of Thermal Spray Technology (Springer).
- **Dr. Kallol Mondal** has been elected for the Gireesh Jankinath Chair for a period of three years.
- **Dr. Krishanu Biswas** has been awarded the Fellowship by Electron Microscope Society of India (EMSI) for the year 2022 under material science category.
- **Dr. Sudhanshu Shekhar Singh** has been elected for the P. K. Kelkar Fellowship for a period of three years and also been selected as a member of the Indian National Young Academy of Sciences (INYAS) for a period of 5 years
- **Dr. Nilesh Badwe** has been appointed as an Associate Editor of the journal "Microelectronics Reliability". The journal is dedicated to disseminating the latest research results and related information on the reliability of microelectronic devices, circuits and systems, from materials, process and manufacturing, to design, testing and operation.
- **Dr. Dipak Mazumdar** has received the Distinguished Alumni Award 2023 from National Institute of Technology Jamshedpur.
- **Dr. Vivek Verma** and his team have developed agarose-based dressings for chronic wounds. The dressing helps in reducing microbial onslaught and modulates the physiology at the wound site allowing it to heal.

Faculty List

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Niraj Chawake
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Anshu Gaur
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Deepak Gupta
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Nilesh Prakash Gurao
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Kallol Mondal
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Rajdip Mukherjee
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Sandeep Sangal
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Rahul Sarkar
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Rajiv Shekhar
(On Deputation: Director, IIT(ISM) Dhanbad)
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Shashank Shekhar
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Amarendra Kumar Singh
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Anish Upadhyaya
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Vivek Verma
Website: http://home.iitk.ac.in/~vverma

Dipak Mazumdar
(Emeritus Faculty)
Website: https://home.iitk.ac.in/~dipak/

Pulickel M Ajayan
(Distinguished Honorary Professor)
Professor of Materials Science and
Nano Engineering, Rice University
https://ajayan.rice.edu/pulickel-ajayan.html

Distinguished Alumni

Mr. Suresh Pandey
(BT/MME/1965)
(Former Director, Bokaro Steel Plant)
(Management excellence)

Prof. Jagdish Narayan
(BT/MME/1969)
(Prof., Carolina State University)
(Academic excellence)

Mr. B. K. Shah
(BT/MME/74)
(Exec. Director, AIA)
(Entrepreneurial Excellence)

Mr. Som Mittal
(BT/MME/1973)
(Former Chairman, NASSCOM)
(Management excellence)

Prof. Veena Sahajwalla
(BT/MME/86)
(Scientia Professor, UNSW)
(Academic Excellence)

Dr. Pramath Raj Sinha
(BT/MME/86)
(Founder, Ashoka University)
(Service of the society at large)

Past Recruiters

Contact Us

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