

Department of Materials Science & Engineering
Indian Institute of Technology, Kanpur

PLACEMENT BROCHURE



2021-2022

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Dear Recruiter...

Greetings from the Department of Materials Science and Engineering, Indian Institute of Technology Kanpur. We sincerely hope and wish that some of our students will soon be part of your esteemed organization, and rest assured that they will contribute immensely to the progress of your organization.

Students graduating from Materials Science and Engineering Department at IITK undergo a rigorous training program which includes not only thorough course work, but also meticulously planned hands-on training by way of laboratory works and projects and thesis. The department provides students technical knowledge on state-of-the art laboratory and facilities, that is comparable to the best in the world.

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, 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

2020-21 Batch



UG Coursework

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



PG Coursework

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

*compulsory

Academic Curriculum

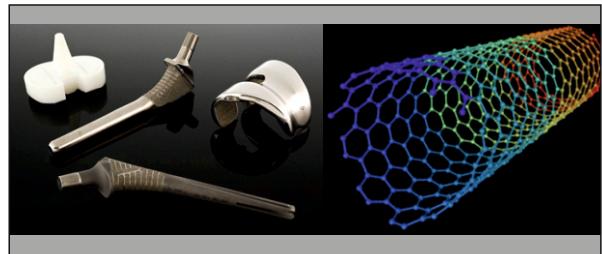
Metallurgical Engineering



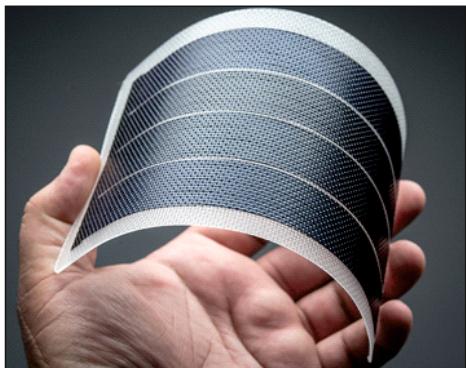
- Iron and Steel Making
- Principles of metal extraction and refining
- Phase Transformations
- Thermodynamics & Phase Equilibria
- Mechanical Behaviour of Materials
- Materials Failure: Analysis and Prevention
- Structure and Characterization of Materials
- Diffusion in Solids

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



Conferences and QIP courses Held in the academic Year 2020-2021

- 6-days online QIP Course titled "Mechanical Behaviour of Materials" on Mar. 15-20, 2021.
- 6-days online QIP Course titled "Theoretical and Practical Perspective on Material Manufacturing Technology" on Mar. 08-13, 2021.
- 6-days online QIP Course titled "Corrosion Failure and Protection of Engineering Materials" on Mar. 01-06, 2021.
- 6-days online QIP Course titled "Advanced Ceramics and Composites for Multifunctional Applications" on Mar. 01-06, 2021.
- The Energy Sustainability and Water - SUNRISE conference from 22nd to 23rd February 2021. Link: <https://www.nanoge.org/SUNRISEVII/home>
- QIP 6-day short term course titled "Mastering Advanced Techniques of Characterization for High-end Research (MATCH-2021)" on 25-31 January

Research Areas and Projects

Research Areas



Health Care



Energy and Environment



Electronic Materials & Devices



Railways, Automobiles, Space and Defence Technologies



Iron, steel & other metals

On Going 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 Behaviour of Materials
- Stereology, Crystallography
- Glassy Alloys, Quasicrystals
- Nanomaterials/ Composites
- 3D and additive Manufacturing

Departmental Activities

Department Bodies



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



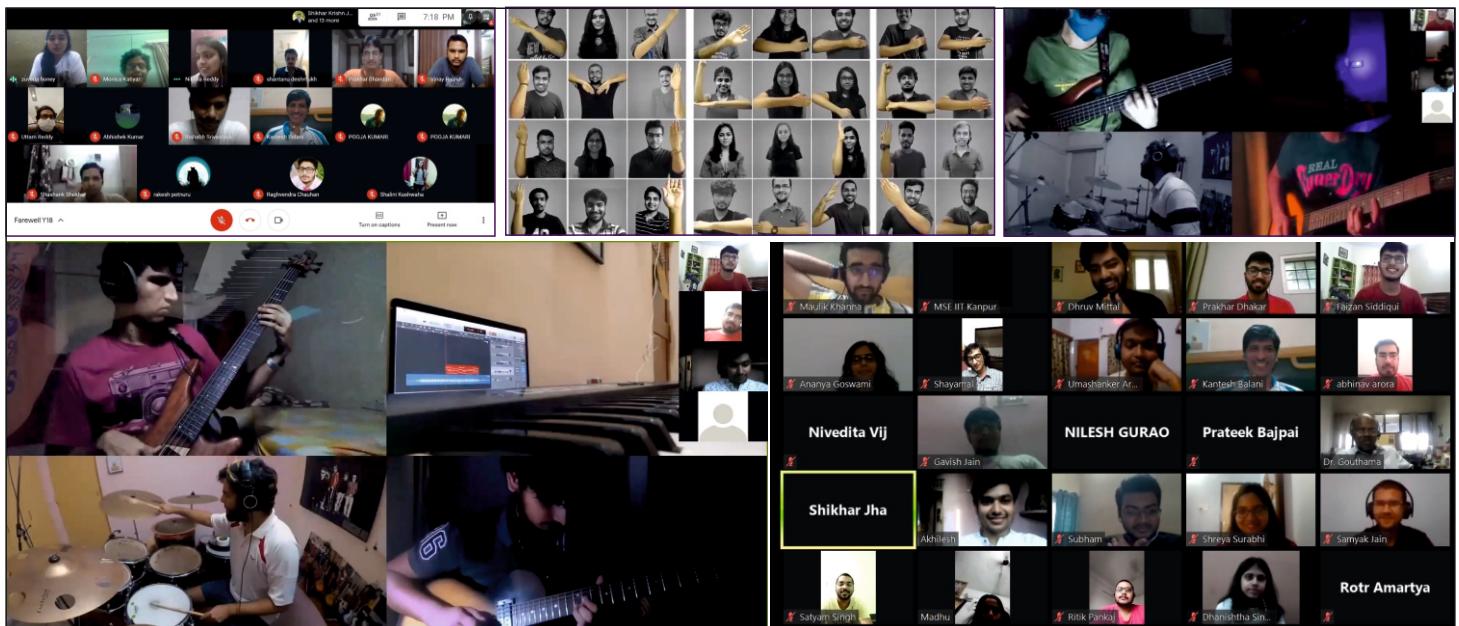
Material Advantage is a window providing access to the materials professional's most eminent societies like ASM, TMS, AIST and Acers.



Materials Science and Engineering Society is an integral student body which organizes various departmental seminars, workshops, recreational activities

Farewell Y-18 PG & Y16 UG Students

COVID 19 pandemic has disrupted academic activities and has taken toll on campus life of IITK. However, this couldn't deter the spirit of the pre-final year students in bidding farewell to their lovely seniors. To relish those golden memories, Y19 batch in association with MSES organized the "online farewell party" on Date: 16th Aug, 2020, for the passing out Y18 (PG) batch and Y16 (UG) batch. During the event, Faculty members, students, all shared their memories and laughs with the outgoing batch and finally bidden them goodbye by wishing them best of luck for their future endeavours. Also a token of appreciation was also handed over to the graduating batch



Department Achievements

- The Board of Trustees of ASM International has elected Prof. Kantes Balani as a Fellow of the Society for his outstanding contributions in the areas of biomaterials and ultrahigh-temperature ceramics, and exemplary leadership in materials education.
- Prof Kaustubh N Kulkarni, Vivek Verma, Aparna Tripathi on being awarded the prestigious 2020 Gordon E. Pike Prize for the Journal of Materials (JMR) Paper of the year, recognizing excellence in advancing materials knowledge through written scholarship.
- Mr. Ankur Agnihotri, Dr. Prince Kumar Singh, Mr. Rishikesh Mishra, and Prof. Dipak Mazumdar's research paper titled "Steady-State Materials and Enthalpy Balance: Applications to Ferroalloy Production and Industrial-Scale Validation" has been selected for IIM SAIL Gold Medal during the NMD ATM 2020 conference (Best Ferrous Paper Medal from papers published in Transactions of IIM 2019 issues).
- Prof. Sudhanshu Shekhar Singh is awarded the NASI-Young Scientist Platinum Jubilee Award in Physical Science, 2020 for his pioneering contributions in Deformation behavior of Materials, Laser Processing of Materials, Corrosion, and 3D/4D Materials Science.
- Two members of Material Advantage @ IIT Kanpur chapter have bagged Prizes in the International conference:
 - (i) Ms. Shruti Dubey (Ph.D., MSE Department) won the first virtual MS&T Trivia with a score of 430 points.
 - (ii) Ms. Rubia Hassan (Ph.D., MSE Department) has won the third place in the SEM category of Ceramographic competition 2020 organised by ACerS (American Ceramics Society).



Awards & Honours 53rd Convocation 2020
Department of Materials Science & Engineering
Indian Institute of Technology Kanpur



Congratulations & Best Wishes



Dhruv Mittal
GENERAL PROFICIENCY MEDAL

Bharat Bhushan
OUTSTANDING PhD THESIS AWARD

Siddhant Bhushan
MARS G. FONTANA PRIZE

Anshuman Sinha
PROFICIENCY MEDAL

Ankita Anjali
BATRA GOLD MEDAL

Zuveria Firdouz
BOGINENI CHENCHU RAMA NAIDU GOLD MEDAL

Reshma Sonkusare
PROF. BAL DEVA UPADHYAY MEMORIAL GOLD MEDAL

Dhruv Mittal
IIT KANPUR EXCELLENCE AWARD IN ART & CULTURAL ACTIVITIES

Student Placement Preparation

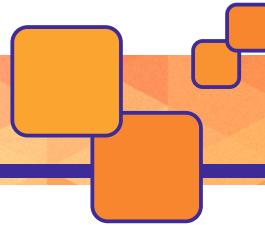
The placement office and department bodies assist students in their preparation for their placement and internships. Placement Office regularly organizes preparatory programs for students helping them to enhance communications skills, individual domain competency, group dynamics, and interview skills.

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. At the departmental level, the Material Advantage @ IIT Kanpur chapter initiates a “one-on-one mock interview” session to help students for the placement session and raise their proficiency to perform well to the companies expectations.

Collaborations



Faculty list



Nilesh Badwe

Ph.D, Arizona State University, USA

Specialization: Mechanical properties of materials, Microelectronics packaging, Nanoporous metals, Electrodeposition of nanocrystalline alloys, Interconnect materials

Kantesh Balani

Ph.D (Florida International University, U.S.A)

Specialization: Biomaterials, Ultra-high Temperature Ceramics, Nanocomposites, Energy Materials, Nanomechanics

Somnath Bhowmick

Ph.D (I.I.Sc Bangalore)

Specialization: Computational Materials Science

Krishanu Biswas

Ph.D (I.I.Sc Bangalore)

Specialization: Nanomaterials, Phase Transformation, Electron Microscopy, Graphene

Niraj Chawake

Ph.D (Indian Institute of Technology Madras)

Specialization: Fundamental and applied studies in the processing and properties of material systems for high temperature structural applications

Anshu Gaur

Ph.D (University of Illinois, U.S.A)

Specialization: Electronic Materials, Nanomaterials, Device Physics and Device Characterization

Deepak Gupta

Ph.D (University of California, Berkeley, U.S.A)

Specialization: Displays, Oxide TFTs and Memories

Nilesh Prakash Gurao

Ph.D (I.I.Sc Bangalore)

Specialization: Crystallographic Texture, Thermomechanical Processing and Mechanical Behavior of Materials

Sarang Ingole

Ph.D (Arizona State University, U.S.A)

Specialization: Semiconducting Materials, Silicon Nanowires

Shikhar Krishn Jha

Ph.D (University of Colorado, Boulder, USA)

Specialization: Thermodynamics of phase transformations, Structure of material, Interfaces, and Solid state physics

Monica Katiyar

Ph.D (University of Illinois, Urbana Champaign, U.S.A)

Specialization: Opto-electronic Materials and Devices

Kaustubh Kulkarni

Ph.D (Purdue University, U.S.A)

Specialization: Multicomponent Diffusion and Phase Equilibria, Automobile Materials; Materials and Process Design

Tanmoy Maiti

Ph.D (Penn State, U.S.A)

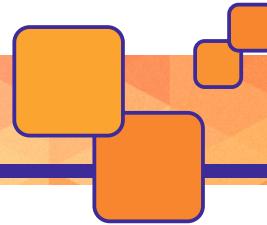
Specialization: Electronic Materials, Thermoelectrics, Perovskites, Plasmonics

Dipak Majumdar

Ph.D (McGill University, Canada)

Specialization: Steelmaking, Modeling

Faculty list



Kallol Mondal

Ph.D (IIT Kharagpur)

Specialization: Environmental Degradation, Physical Metallurgy, Steel, Glassy Alloys, Corrosion

Rajdip Mukherjee

Ph.D (I.I.Sc Bangalore)

Specialization: Microstructure Modelling and Simulations

Kanwar S. Nalwa

PhD (Iowa State University, USA)

Specialization: Organic and inorganic semiconductors, Perovskite based solar cells, Organic/Inorganic Tandem photovoltaics , Nanomaterials and thinfilms

Shobit Omar

Ph.D (University of Florida)

Specialization: Defect Chemistry in Solids, Oxygen Ion Conductors, Thermal Barrier Coatings, Solid Oxide Fuel Cell Technology

Sandeep Sangal

Ph.D (University of Manitoba, Cana)

Specialization: Physical and Mechanical Metallurgy

Rajiv Shekhar (On Deputation: Director, IIT(ISM) Dhanbad)

Ph.D (University of California, Berkeley, U.S.A)

Specialization: Non-ferrous Extractive Metallurgy, Electrometallurgy, Concentrated Solar Thermal Power for Materials Processing, Electromediation of Heavy Metal Contaminated Soil

Shashank Shekhar

Ph.D (Purdue University, U.S.A)

Specialization: Thermomechanical Processing, Material Interface

Amarendra Kumar Singh

Ph.D (IIT Kanpur)

Specialization: Steel Refining and Casting, Extractive Metallurgy, Integrated Computational Materials Engineering

Sudhanshu Shekhar Singh

Ph.D (Arizona State University, U.S.A)

Specialization: 3D/4D Materials Science, Mechanical Metallurgy

Anandh Subramaniam

Ph.D (I.I.Sc Bangalore)

Specialization: Physical Metallurgy and Materials Science

Anish Upadhyaya

Ph.D (Penn State University, U.S.A)

Specialization: Powder Metallurgy, Sintering of Ferrous and Non-ferrous Alloys and Composites

Vivek Verma

Ph.D (Penn State University, U.S.A)

Specialization: Biomaterials, Protein Patterning, Biodegradable Materials

Gouthama

(Emeritus Faculty)

Ph.D (I.I.Sc Bangalore)

Specialization: Electron Microscopy, Physical Metallurgy

Kinnor Chattopadhyay

(Visiting Faculty)

Ph.D (McGill)

Specialization: Fundamentals of metallurgical thermodynamics, transport phenomena

Distinguish 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



vmock



OPTUM

ninjacart



Contact Us



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