

MATERIAL SCIENCE PROGRAMME

INDIAN INSTITUTE OF TECHNOLOGY KANPUR



DEPARTMENTAL PLACEMENT
BROCHURE

2021-2022

HOD'S MESSAGE



Dr. Rajeev Gupta
Head, MSP

The growth of our civilization has been critically dependant on materials which we have been able to harness for our technologies. The technologies of today use a large variety of materials with tailor-made properties, and stringent demands on performance much beyond that can be obtained from naturally occurring materials. Material Science Programme here at IIT Kanpur has a very strong interdisciplinary approach with both students and faculties coming from different backgrounds. Our student intake is generally from engineering streams such as electrical, mechanical, materials, chemical and science streams of physics and chemistry. These students are put through a rigorous coursework giving them a solid grounding in fundamentals and application of material science. Subsequently, these students peruse independent projects with faculty members for their thesis in areas such as chemical sensors, Nano-composites, batteries, microwaves, multiferroic oxide. We believe that employers would find tremendous value in the training programme imparted here at IIT Kanpur.

FACULTY INCHARGE'S MESSAGE



Education at IIT Kanpur is the prime focus of a student. The interdisciplinary programme in Material Science has a conglomeration of eminent faculties from mechanical, chemical and electrical engineering, physics, chemistry department guiding students towards their post graduate degrees. The interdisciplinary learning has succeeded the programme to accomplished a vast number of research publications and excellent placement record.

Bringing together the innumerable components of science and technology and to get them working in tandem has been a key challenge and I am glad that the student have been able to embrace it well. I wish the students all the best for placement session of 2021- 22.

Dr. Siddhartha Panda
(Dean, Students Affairs)

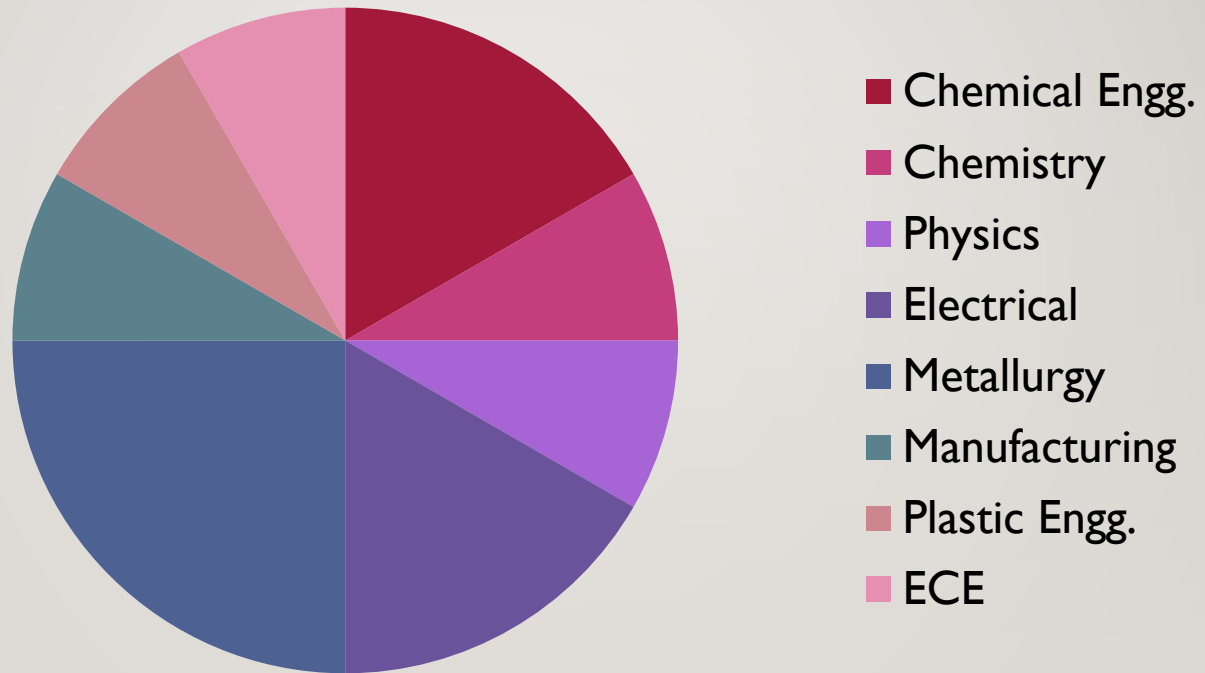
ABOUT US...



Advances in technology today are limited by the availability of newer materials with desired properties. Thus the thorough study of existing material and the tailor making of new functional materials are to be continues with increasing vigor. Such a task, however, requires an integrated approach to the subject using established principles of science and engineering. Keeping this objective in view and to provide focus and coordination for teaching, research and development, an Interdisciplinary Programme in Materials Science was initiated at IIT Kanpur at postgraduate level in July 1971. Selection Criteria for this Programme is GATE score and a IIT Kanpur written test.



STUDENT'S PROFILE



COURSES

Compulsory Courses

- Structural and Magnetic properties of materials
- Electrical and Dielectric properties of materials
- Mechanical properties of materials
- Characterization of materials
- Engineering materials.

Elective Courses

- Materials selection in Mechanical devices
- Computer simulations in materials science
- Charge and heat transport in semiconductors
- Electromagnetic Interference and compatibility techniques
- Principles of heterogeneous catalysis
- Physics of semiconductor and nanostructure
- Introduction to flexible electronics.
- Mathematics and computational methods
- High Performance polymers and composites
- Electronic devices and characterization.

ONGOING PROJECTS

- Phosphors of solid state illumination
- MgO based systems for plasma display panels
- ZnO based transparent conducting oxides for photovoltaic and spintronic devices.
- Materials for fuel cell, solar cell, Li-battery, High energy batteries
- FIB fabrication of nano devices
- Polymer
- Nano composites, Biomaterials
- High Tc superconductors
- Thermoelectric materials
- Functionally graded materials
- Nature of metal semi-conductor interface/ Schottky junctions
- Carbon nanotubes
- Fast ion conductors or superionic conductors
- Multi-elements perovskite-type oxide membranes for gas separation
- Nanostructured materials

RESEARCH FUNDING AGENCIES



Ministry of Human Resource
Development
Government of India





Dr. Rajeev Gupta
HOD
IISc Bangalore



Dr. Y. N. Mohapatra
IISc Bangalore



Dr. Kamal K. Kar
IIT Kharagpur



Dr. Siddhartha Panda
University of Houston



Dr. Jaleel Akhtar
University of Magdeburg



Dr. R.G.S. Pala
University of Pune



Dr. J. Ramkumar
Cornell University



Dr. Sri Sivakumar
University of Victoria



Dr. Manas K. Ghorai
NCL Pune

FACULTIES

FACILITIES

- Transmission Electron Microscopy
- Scanning Electron Microscopy
- Rutherford Back Scattering
- PC Interfaced I-V measurement (40-310K)
- Controlled Atmosphere Glove Box
- Mossbauer Spectrometer, NMR, EPR
- Fuel Cell Test Rig
- Vacuum Coating Units with E-Beam/ Thermal Evaporation
- Liquid Helium Plant
- DC/AC, Two/ Four Probe Resistivity Measurement Setup (10-1800K)
- Thin Film Preparation/ Characterization
- Diamond Saw
- Ceramic Processing Facilities
- X-Ray Powder Diffractometer
- Deep level Transient Spectroscopy
- LCZ meter (Hewerd Packard Model 4276A)
- Precision Balance
- Twin Rollerand Isostatic Press
- Atomic Force Microscopy

- Null Detector/ Micro voltmeter (Keithley 155)
- Debye Scherrer, Oscillation and Laue cameras
- Electrophoresis Apparatus
- Programmable Electrometer/ source (Keithley 617)
- Electron Probe Micro analyser
- SQUID (Super conducting Quantum Interference device)
- UV-VIS double beam spectrophotometer (Hitachi 150-20)
- Vibrating Sample Magnetometer
- Materials Testing System (UTM)
- Electro magnet (Polytronic model HEM-75)
- Rockwell type Hardness Tester (Buehler Macromet I)
- PECVD
- RF Sputtering Unit
- Raman Spectroscopy
- Cryostat (Oxford Instrument)
- Moller Inter ferometer
- Minimet Polisher (Buehler)



LABORATORIES

- Advanced Nano-Engineering Materials Lab
- Solid State Ionics Lab
- Electronic Microscopy Lab
- Magnetic Testing Lab
- Surface Characterization Lab
- X-ray Diffraction Facility
- Optical Spectroscopy Lab
- Indentation Lab
- Powder Size Characterization Facility
- Materials Science Instructional Lab
- Electrical Characterization Lab
- Photonic and Electronic Materials Lab
- BET, FTIR and BET Solar Simulator Facility
- Sample Preparation Lab
- Thermal Analysis Lab
- Live Cell Imaging Lab
- Mechanical Testing Lab
- Texture Lab
- Slow Strain Rate Testing Lab
- Central Facilities
- XRF- IRMS Lab

PAST RECRUITERS



ABB



SAMSUNG



APPLIED
MATERIALS®



ORACLE®



ap
asianpaints



IBM



intel®



HSBC



Forbes

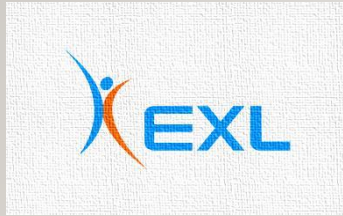


ATC Labs

Audio Technologies and Codecs



Schlumberger



DISTINGUISHED ALUMNI



Rajiv Arya

CEO.- Moser BaerPhotovoltaic Ltd.



Amitabh Verma

VP. -Aditya Birla Management Corp.
Pvt. LTd.



Manvendra Bangui

Head-Tagrem India Pvt. Ltd.



Ivan Saha

President and CTO-Vikram
Solar

WHAT TO WE HAVE TO OFFER?

Materials are the basis of everything. They are required every where starting from developing of prototype to manufacturing of the end product. Be it an electronic device or a mechanical device, all of them are made of different types of materials which must in one hand serve the actual purpose and secondly should also be compatible with each other. Thus for the same, one should have the sound knowledge of all the characteristics of the material i.e. mechanical, electrical, optical, thermal etc. Being an interdisciplinary department, students of Material Science Programme(MSP) are equipped with such skills related to all these fields so that he/ she can easily manipulate and play with the properties of any material to make it useful for a given purpose. Students of MSP are exposed to both theoretical and practical based knowledge which allows them to solve critical problems in diversified areas such are those related to bio prosthetics, sensors, batteries, meta materials, micro processors etc. It is therefore in the year 1971, this interdisciplinary approach was started and was meant to address all kind of diversified problems, even those which are not covered under the scope of core departments.

Thus recruiting the MSP graduates will give any company a new dimension in its growth and development.

CONTACT US...

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