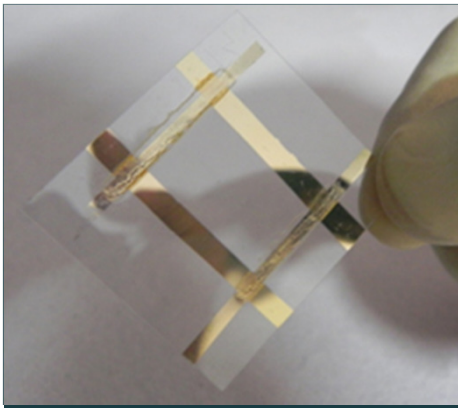


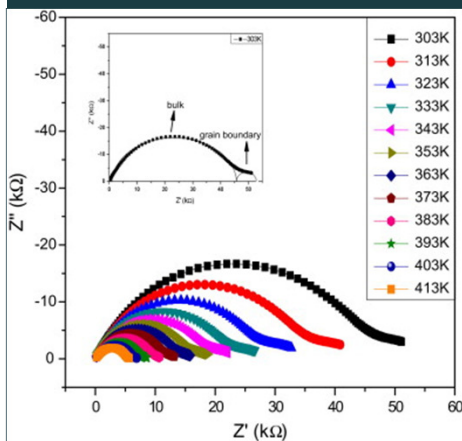
materialscience program

Indian Institute of Technology Kanpur
Kanpur – 208016, India

www.iitk.ac.in/msp
+91-512-259-7740



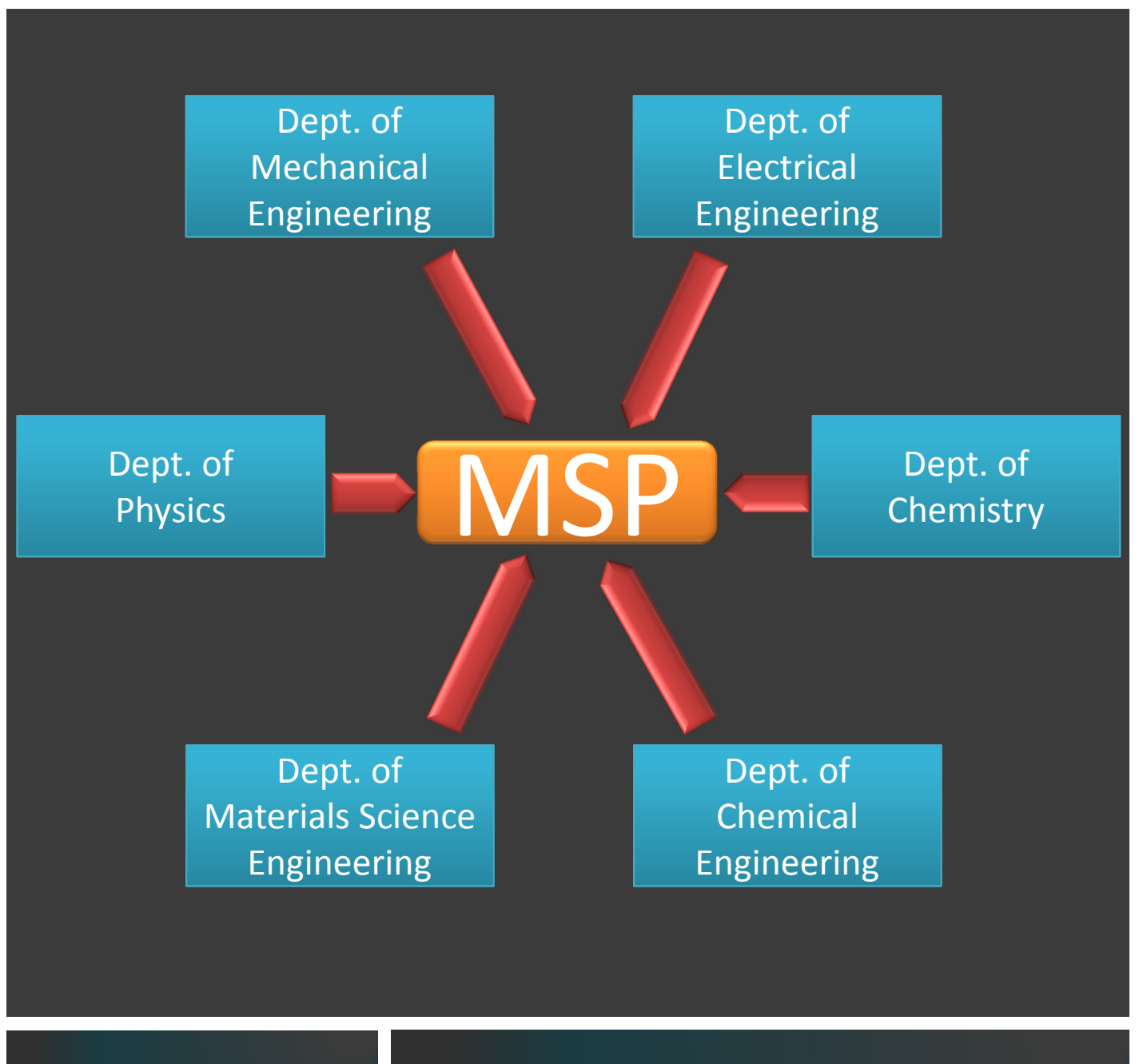
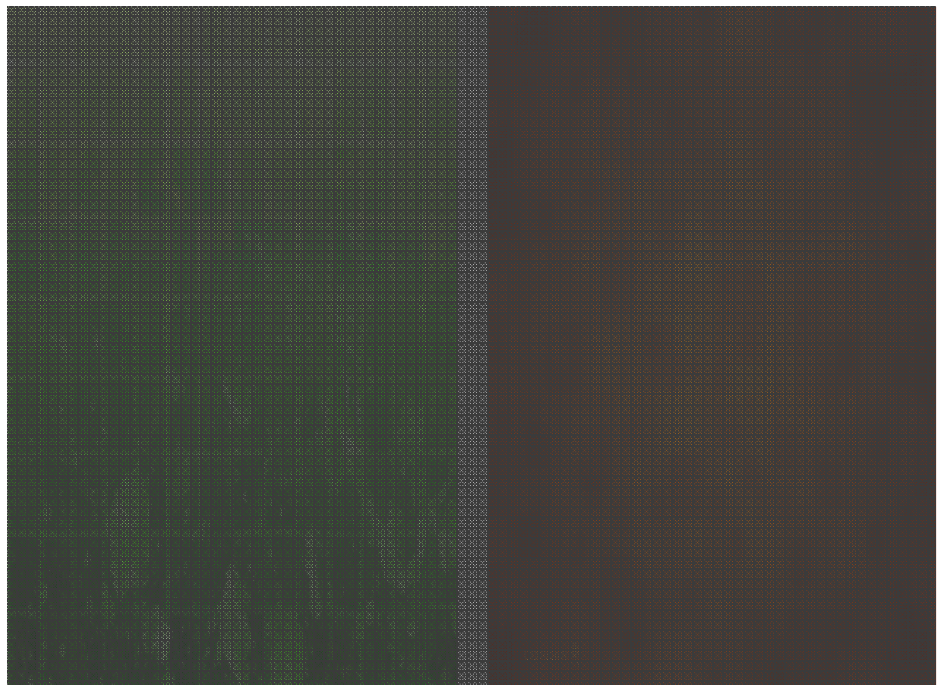
Welcome to a composite
experience of IIT Kanpur



Recruitment
Walkthrough



Masters of Technology
2012 - 2014



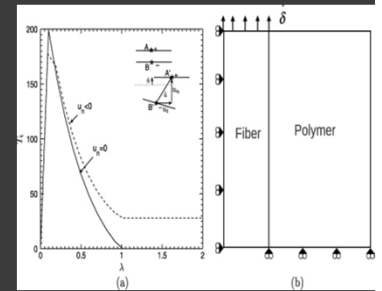
The Institute

Indian Institute of Technology, Kanpur is one of the premier Institutes established by the government of India. The Institute is ideally located in a sprawling campus and is home to about 3000 undergraduate, 3000 postgraduate, 350 faculty members and over 1500 supporting staff. Since its inception, IIT Kanpur has been striving to develop into an institution of excellence in education and research in consonance with the contemporary and future needs of India. The combined record of its faculty and students along with its world renowned alumni is awe inspiring. With path breaking innovations in both curriculum and research the Institute has carved an exclusive name for itself. The institute offers its students an outstanding academic environment coupled with world-class infrastructure. Not only does it celebrate freedom of thought, cultivate vision and encourage growth, but it also inculcates human values and concern for the environment and safety. Having been ranked as the **best engineering institute** in India for few consecutive years, IIT- Kanpur is home to the best minds of the country.



Why MSP?

The first Interdisciplinary postgraduate programme in India, Materials Science Programme@IITK has been catering to the growing needs and expert requirements of the world since 1971. With an experienced pool of faculty leading talented students at both Graduate and Doctorate level, the programme offers one of the most holistic educational centers in the nation. With excellent placement records and research publications, the programme is one of the most sought after in the country, mixing valuable ideals of Science and Engineering, Ethics and human values. Laboratory skills and research skills are promoted throughout the department. Students are encouraged to be involved in various non academic activities to develop a multi talent role.



Admissions are competitive, with students from backgrounds of Physics, Chemistry, Mechanical Engineering, Materials Science Engineering, Polymer Engineering, Electronics and Communications Engineering, Electrical and Electronics Engineering, Ceramic Engineering, Chemical Engineering, and Biotechnology. The admissions are normalized according to competitive national tests like GATE, CSIR-UGC along with written exam and interview.

Academic programs

M.Tech

[Compulsary courses]

[Electives]

[M.Tech. Thesis]

Ph.D

[Electives]

[Ph.D. Thesis]

Coursework

Students undergo a year of rigorous coursework which aids them during a year of research projects and subsequent industrial employment. The courses are designed to impart fundamental concepts as well as State-of-the-Art topics.

M.Tech. Thesis

This is a part of the curriculum for M.Tech. programme. Thesis let students specialize in a field of their choice Student works on a research topic 1½ years. He/she is required to study the relevant literature in detail and formalize the entire problem through subsequent research.

Compulsory Courses

- >>Structural and Magnetic Properties of Materials
- >>Electrical and Dielectric Materials
- >>Mechanical Behaviour of Materials
- >>Characterization of Materials
- >>Materials Engineering

Elective Courses

Few interdisciplinary electives that were taken by the students >>Electron Microscopy & Microanalysis

>>Physics of Semiconductor Devices

>>Mechanics of Highly Deformable Structures

>>Cell & Molecular Biology

>>Computational Number Theory And Algebra

>>Advanced Engineering Electromagnetics

>>Quantum Informatics

>>Finite Element methods in Engineering

>>Flow, Heat and Mass transfer in porous media

>>Machining Science

>>Surface Phenomena and Related Properties

>>Materials for Energy Conversion Devices

>>Crystal Growth Theory and Practice

>>High Performance Polymers and Composites

>>Process control principles in microelectronic fabrication

>>Microwave imaging and NDE

>>Mechanics of composite materials

>>Nanoscience

Research Highlights

Nanotechnology, Nano-Materials Characterization, Solid State Illumination, Plasma Display Panels, Transparent conducting oxides, Photo-Voltaics and Spintronic devices, Oxides membranes for gas separation, Nature of Metal-Semiconductor Interface/ Schottky Junctions, FIB fabrication of Nano-Devices, Fast Ion Conductors/Superionic Conductors, High Energy Batteries, High Tc Superconductors, Carbon Nanotubes, Nano-structured Materials, Functionally Graded Materials, Materials for Fuel cell, Solar cells, Li-batteries, Polymers, Thermoelectric Materials, Nanocomposites, Biomaterials, sensors, microwaves



**Academics,
Research**

This interdisciplinary department has collaborations with department of mechanical, chemical, electrical, and civil engineering and has several facilities in cutting edge technology. Also the department is supported by instruments in central facilities. For their projects, Students have used one or more of the department labs and facilities.

Laboratories

- >> Advanced Nano-Engineering Materials Lab
- >> Materials Science Instructional Lab
- >> Optical Spectroscopy Lab
- >> Photonic And Electronic Materials Lab
- >> Solid State Ionics Lab
- >> Thin Films Lab
- >> Central Facilities
- >> Chemical Sensors Lab
- >> RF and Microwave Characterisation
- >> Micro/nano machining and manufacturing science lab
- >> Energy Conversion and Storage Laboratory
- >> Synthetic and Mechanistic Investigation Lab
- >> Printable electronics and nanoscience Lab
- >> Samtel Centre for Display Technology

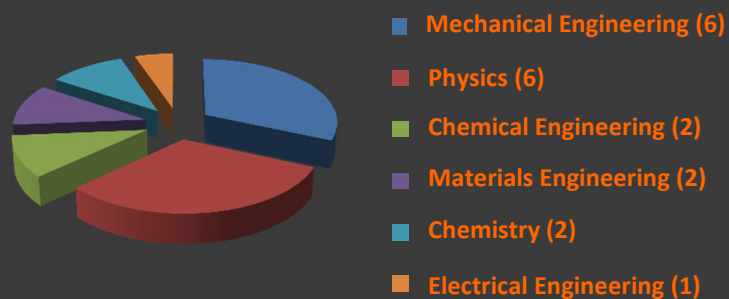
Facilities

Transmission Electron Microscope, Thin Film Preparation/Characterization, Electron Probe Micro Analyzer, Twin Roller, Scanning Electron, Microscope, Atomic Force Microscope, X-Ray Powder Diffractometer, Iso-Static Press, Materials Testing Systems(UTM), Fuel Cell Test Rig, Vibrating Sample Magnetometer, Rutherford BackScattering Spectrometer, Vacuum Coating Units With E-Beam /Thermal Evaporation, Mossbauer Spectrometer, NMR, EPR, Ceramic Processing Facilities, High Temperature Furnace, Faraday Balance Diamond, Saw Spark Cutting Machine, Particle Size Analyzer, Differential Thermal Analyzer, Controlled Atmosphere Glove Box, Closed Cycle Helium Refrigerator, DC/AC Two/Four Probe Resistivity Measurement Setup (10 - 1800K), PC Interfaced I-V Measurements (40 - 310K), Impedance Analyzers (Agilent), Deep Level Transient Spectroscopy, UV/Visible Spectrophotometer, TGA & DSC, Clean air bench with HEPA filters, Clean wet and dry bench with HEPA filters, Micro Machining Center, Magnetic Abrasive Finishing Set-up, Magnetic Abrasive Finishing Set-up, Magnetic Abrasive Finishing Set-up(TOP), Pin on Disk tribometer, Universal Rotational Abrasive Flow Finishing Experimental Set-up, Ball Milling Set-up, Surface Analyzer, Excimer Laser, CNC machines, Fluorescence Spectroscopy, Fluorescence Microscope, Confocal Microscope, UV-Vis Absorption Spectroscopy, FTIR, Tubular Furnace, Muffle Furnace, Cell-culture facility, Autolab Electrochemical, Microfluidics infrastructure, Spin coater, Vacuum furnace, Scalar and Vector network analyzers

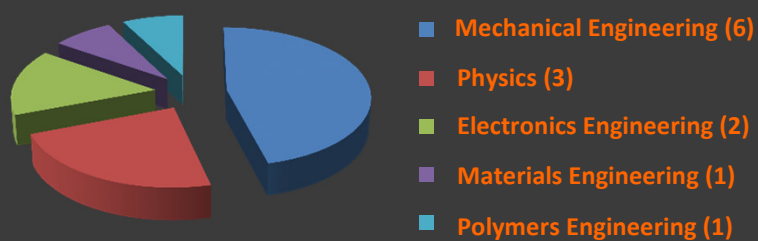


**Laboratories,
Facilities**

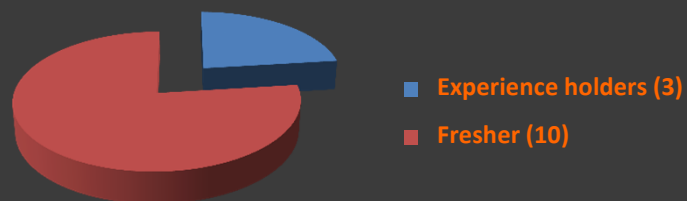
Faculty Background



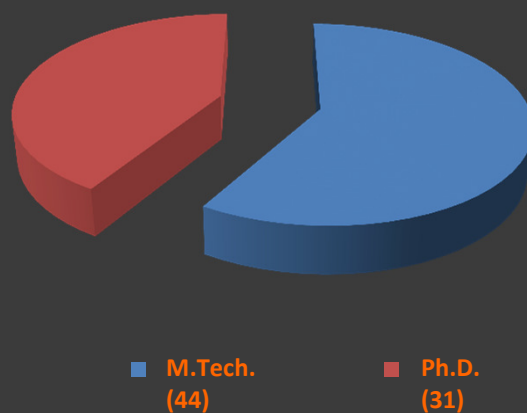
Students' Background



Students' Experience



Current strength including students of all years



Demographics

Faculty Profile



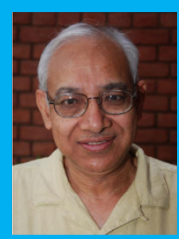
- Ph.D (IISc Bangalore)
- Experimental Condensed Matter
- Optical Spectroscopy
- <http://home.iitk.ac.in/~guptera/>

Prof. Rajeev Gupta



- Ph.D (IIT Kharagpur)
- Nanostructured Materials
- Functionally Graded Materials
- Solar Cells
- Fuel Cells
- <http://home.iitk.ac.in/~kamalkk>

Prof. Kamal K Kar



- Ph.D (BHU)
- Nanotechnology
- Electronic and magnetic Recording
- Hydrogen Energy Storage
- Materials

Prof. Jitendra Kumar



- Ph.D (IISc Bangalore)
- Electronic and Optoelectronic Materials
- Hybrid Inorganic/Organic Devices
- <http://home.iitk.ac.in/~ynm/>

Prof. Kamal K Kar



- PhD (Victoria)
- Multifunctional La-doped Nanoparticles and LED
- Polymer nano capsules drugs
- <http://www.iitk.ac.in/che/faculty/srisiva/index.htm>

Prof. S. Sivakumar



- Ph.D (Houston)
- Chemical Sensors
- Micro/Nano Fab, Lab on chip
- Plasma Processing
- <http://www.iitk.ac.in/che/spanda.htm/>

Prof. Siddhartha Panda

Faculty Profile



- Ph.D (IIT Madras)
- Micro/Nano Fabrication
- Novel Manufacturing
- <http://home.iitk.ac.in/~jrkumar>

Prof. J. Ramkumar



- Ph.D (PennState)
- Electrochemical Energy Conversion
- Chemically Reacting Systems
- <http://home.iitk.ac.in/~mkdas/>

Prof. Malay K. Das



- Ph.D, (Magdeburg)
- Microwave Material Processing
- Computational Electromagnetics
- Electromagnetic Characterization
- <http://home.iitk.ac.in/~mjakhtar/>

Prof. M. Jaleel Akhtar



- Ph.D (IISc Bangalore)
- Expt. Condensed Matter
- Transition Metal Oxides
- Electronics
- http://www.iitk.ac.in/phy/New01/profile_KPR.html

Prof. K.P. Rajeev



- Ph.D (NCL Pune)
- Synthetic Organic Chemistry
- Novel Method Development
- <http://home.iitk.ac.in/~mkghorai/>

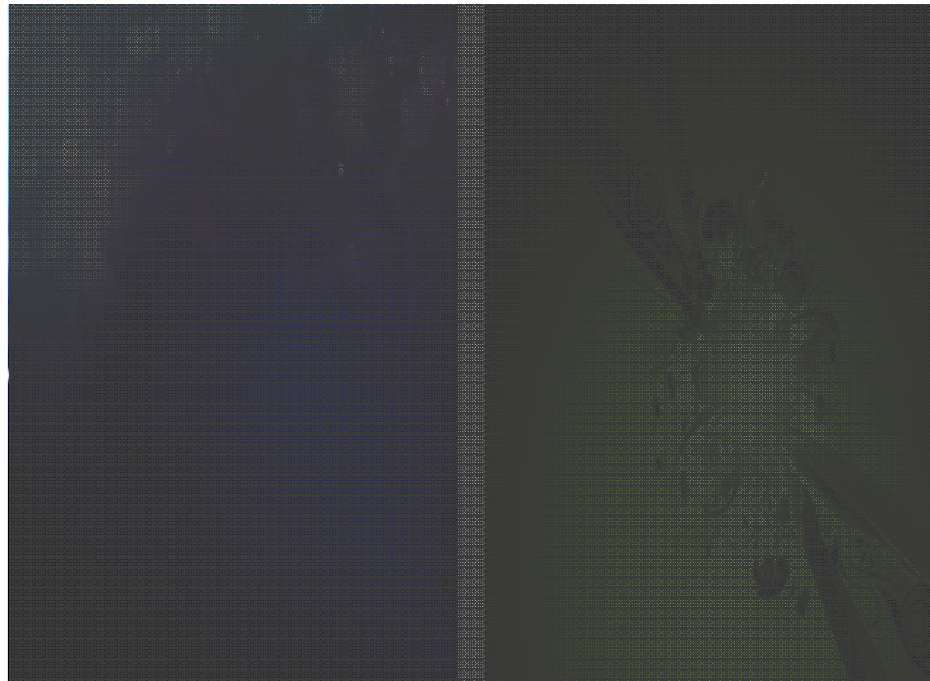
Prof. Manas Ghorai



- D.Sc (Columbia)
- Ceramic Processing
- Structural Ceramics And Composites

Prof. D.C. Agarwal

Recently Retired



Faculty Profile



- Ph.D (Gorakhpur Univ)
- Super-ionic/Fast ionic conductors
- Solid Electrolytes
- High energy Density Batteries

Prof. Keshav Shahi

Recently Retired