



Placement Brochure 2022-23

School of
Materials Science and Technology

Indian Institute of Technology
(Banaras Hindu University)
Varanasi

Contents

Contents	2
IIT (BHU), Varanasi	3
Materials Science And Technology	4
Academic Programs	5
Course Structure	6
Areas of Research	9
Lab Facilities	10
Collaborations & Achievements	12
Internship Experience	13
Faculty Profiles	14
Why Us	15
Major Past Recruiters	16
Contact Us	17

IIT (BHU), Varanasi



The Indian Institute of Technology (Banaras Hindu University) is one of the premier engineering institutions in the country and has consistently ranked amongst the top ten colleges for engineering by surveys like Outlook, India Today, etc. Founded in 1919 as the Banaras Engineering College, it became the Institute of Technology, Banaras Hindu University in 1968. It was designated an Indian Institute of Technology through The Institutes of Technology (Amendment) Act, 2011. Admissions to IIT (BHU), Varanasi for the 13 departments and three inter-disciplinary schools are made through the prestigious Joint Entrance Examination – Advanced, after clearing Joint Entrance Examination – Mains.

The serene campus with new Vishvanath Temple in center, surrounded by vast research infrastructure and lecture theaters gives indeed a great ambience of learning and research. Encapsulated within BHU, which is ranked third by NIRF ranking, makes this IIT one of a kind. With the 100th year Anniversary of our institution, in 2019, we hope to summon a large number of our Alumni, giving us one of the greatest Alumni Database.

It is a technical institute, and students learn a vast variety of technical and management skills through various national and international competitions which occur throughout the year. From coding, machine learning to research and manufacturing skills, each area is tested and hence improved. We have one of the best Techno-Management fests all over India, Technex, which successfully runs with immense participation. Along with this we also hold the oldest and most vibrant sports festival, Spardha. Multiple stadiums and courts see sportsmanship and spirit in more than twenty different sports and competitions! Not just as a Technical Institute, but as a road to know where one's interest lies, the institute provides culture of Councils, Clubs and Student Communities. Be it art, sports, dance, drama, music, choreography, social work, or photography, the Institute provides resources for all, open to all. With one of the most massive Cultural fest, Kashiyaatra, IIT (BHU) offers the students a great platform to showcase their talents.

Materials Science and Technology



Materials Science and Technology education was introduced in 1978 to fulfil the need of future materials technologists. It is an internationally renowned centre of research in Materials Science and Technology and serves as Institute's nodal centre for fostering interdisciplinary teaching and research in the field of materials science and technology. School of Materials Science and Technology runs PhD and M.Tech. Programmes from its inception and from the session 2005-06, the school has initiated a 5-year Dual Degree M.Tech. Programme with an annual intake of 19 students.

School of Materials Science and Technology (SMST) along with its strong research base, foster the need of industries.

The last few decades have witnessed large-scale technological applications of a plethora of novel and complex materials ranging from ceramics to polymers and their composites. Several of these materials possess functional and intelligent characteristics making them useful for designing smart devices and structures. The emergence of biomaterials, high-temperature superconductors, carbon cluster compounds, and nanomaterials has further extended the horizons of the field of Materials Science and Technology. The subject areas of Materials Science and Technology has become thoroughly interdisciplinary. The more familiar an engineer or technologist is with the structure, properties and processing of these advanced materials, the more proficient and confident he/she would be in making a judicious selection of materials or even in designing a new material with desired characteristics for particular application.

In 2014, following the UG-CRC of the Institute recommendations, School had heavily modified its course structure, to search for and selection of new classes of materials and instruments with a very rapid pace. The program offers a serious interdisciplinary learning experience in materials studies, crossing over the traditional boundaries of such classical disciplines as chemistry, physics, electrical, mechanical, microelectronic, ceramic and metallurgical engineering.

Academic Programs

The school offers a two-year M.Tech. Degree programme with an annual intake of 16 students and has produced over 130 M.Tech. students so far. These students are generally employed in premier R & D organisations, industry and teaching institutions. The school runs a very successful Ph.D. degree programme also. Nearly twenty-five Ph.D. candidates have completed work under the supervision of the faculty members of the School. Given the ever-expanding requirement of the Materials Technology Industry and R & D organisations, a dual degree 5-year Programme, leading to B. Tech. and M. Tech. degrees at the end of the course has been launched at IIT, BHU. This course has been initiated from the academic session 2005-06. The admission will be through the Joint Entrance Examination (JEE) conducted by IITs.

Integrated Dual Degree (IDD)

The courses are so designed that the students develop a comprehensive understanding of the structure, properties, processing and applications of various advanced technology materials and at the same time also acquire specialised skills and knowledge in the selected area of materials technology through the various electives. The dissertation work starting from the summer semester of the fourth year through the fifth year provide the students to develop a flavour of research in frontier areas of advanced materials in a stimulating environment.

Master

M. Tech course has been running since 1982, and over 100 students have passed out. All these students are gainfully employed in various R & D organisations, industries and academic institutions. The admission to this program is based on GATE score cum interview and is open to M.Sc. (Physics), M.Sc. (Chemistry) and B.Tech. students.

Doctorate

Ph.D. degree in a various specialisation of School. The school has a strong Ph.D. programme, and the admission of this programme is through national level examination, e.g. NET and GATE.

Course Structure

The students learn the concepts and develop skills related to materials science and have a broad-based fundamental knowledge of both science and technological aspects of materials research and development with analytical and innovative skills. The students also acquire a broad base of humanities and build their character. The objectives are not only to develop motivation among students for study, knowledge and skills development but also to inculcate theme-based research with innovation aptitude, enhancing creativity with sensitivity towards nature and society.

Along with providing extensive experimental courses in diverse areas of materials-related studies, the program also explores avenues for introducing greater synchronisation between industrial expansion and academic training.

The new academic curriculum is effective since academic session 2014-15. The programme components include courses related to Science, Engineering, Humanities and Social Science, Courses from other branches, Engineering Practice Courses, Language and Management, Departmental Core courses, Exploratory projects, Departmental Electives, Open Electives from other disciplines, Projects, Dissertation/Master's Thesis, Industrial training/internship, Gymkhana Courses, Creative Practice etc. Other than these essential components of the curriculum, faculty members of the school are always open for students indulging in the research projects during their off-hours. Depending on their interests, it is always encouraged that students take up one or two additional research projects during their programme.

Apart from core and interdisciplinary courses, we have following features in our structure :

Open Elatives

Students learn a wide variety of courses from other streams; from Computer Security to Bio Medical Engineering

Projects

Students start exploring project areas right from second year and make significant advancement by the time they graduate

Training

By compulsory internships, students get well versed with the practical knowledge and technical challenges in the areas

Dissertation

Heavy weightage is given for experimental work, to hone presentation skills, data analysis and strategy planning

Language

Students are well equipped with skills in academic writing and professional communication

Management

The concepts of Resource, Time management, Competition, Excellence, and many topics are provided to strengthen the EQ

Humanities

A natural link between engineering and humanities with all round human development is considered

Social Science

Importance of sustainable development, inter-dependence and co-existence in nature is realised

Physical Education

All round development of Personality (physical, mental, social & spiritual development) is achieved

Course Structure

Inter-disciplinary Courses

Core-Engineering

- Engineering Drawing
- Manufacturing Practice
- Engineering Thermodynamics
- Transport phenomenon

Physics

- Introduction to electrodynamics
 - Quantum Physics
- Open Electives :-
- Em waves
 - Solid and Plasma physics
 - Fiber optics

Chemistry

- Introduction to Kinetics
 - Electrochemistry and surface phenomenon
 - Quantum Chemistry
 - Molecular spectroscopy
 - Molecular simulation & chemical informatics
- Open Electives :-
- Solid state chemistry

Mathematics

- Mathematical methods
- Open Electives :-
- Numerical solutions to PDE
 - Fuzzy set theorem

Computer Science

- Computer Programming
- Open Electives :-
- Artificial Intelligence
 - Linear control system
 - Parallel Computing
 - Network Security
 - Data mining

Electronics

- Introduction to electronics & instrumentation
 - Organic electronics & Organic Conductor
- Open Electives :-
- Mechatronics
 - Solid state device

Course Structure

Core-disciplinary Courses

Engineering Materials

- Introduction to engineering materials
- Magnetism and magnetic materials
- Nano-structured materials
 - Composite Materials
 - Advance ceramics

Open Electives :-

- Bio-Ceramics
- Smart materials and structure
 - Bio-Material
- Aerospace & Automotive materials

Material Science

- Phase diagrams & Phase transformation
- Crystallography & Crystal structure
- Physical behaviour of materials
- Materials characteristics
- Mechanical behaviour of materials

Projects

- Exploratory project
- Under graduate project
- Mtech dissertation

Energy

- Energy Materials

Open Electives :-

- Solar Energy Engineering
- Non-Conventional Energy
- Advanced materials of energy devices

Polymer

- Polymeric material
- Polymer processing
- Industrial polymers

Open Electives :-

- Speciality Polymer

Areas of Research

The School receives the usual Plan Grant from UGC and has got some funds under its establishment grant. In addition, the faculty members of the School have generated more than Rs 8.5 crores through sponsored projects funded by agencies like DST, DBT, MHRD, DRDO, AICTE and IUC- DAEF. Recently, DST has sanctioned Rs. 2.7 crore under its 'Funds for Infrastructural Support in Engineering and Technology (FIST) programme-II'. The School is supported through SAP-DRS Programme from UGC for coming years.

The current research activities span over wide-ranging fields of following:



Lab Facilities

The school has got a modest building of about 8,800 sq. ft. floor area and several laboratories equipped with modern and sophisticated equipments for materials preparation, characterisation and phase transformation studies. Following laboratories are for conducting experiments at UG/ PG/ Ph.D. and research levels:



Electron beam with
thermal vapour
deposition
system



UV – Vis
Spectrophotometer



Low Temperature
Resistivity Measurement
Setup deposition
system



Impedance
analysis interface



Lyopho Lizer



Glove Box



Chemical vapour
deposition
system



18 KW Rotating Anode
X-Ray Diffractometer



Fume Hood



Centrifuge
and Spin Coater



Fluorescence
spectrophotometer



Plasma Surface
Technology



Spin Coating
Instrument



Keysight B2912A
(I-V Source unit)



Thermal Evaporation
Deposition System



Physical Property
Measurement System



Alpha-A
High Performance
Frequency Analyser

Collaborations & Achievements

Academic Collaborations

EMAT-University Of Antwerp,
Belgium

Paul Scherrer Institute,
Switzerland

POSTECH, PLS,
S. Korea

Kyushu Institute of Technology,
Japan

University de Girona,
Spain

Indian Institute Of Science,
Bangalore, india

UGC-DAE-CSR, Mumbai And
Indore, India

Asian Paints Limited

University Of Mainz,
Germany

University Of Sydney

Moser Bear India Limited,
India

Bhabha Atomic Research
Institute, Mumbai, India

Inter University Accelerator
Center, India

Major Achievements

• International Refereed Journals	42
• Membership Of Editorial Board Of Journals	06
• Awards	22
• Sponsored Projects	28
• Publications	437+
• Patents	12+

Internship Experience



NUS Singapore



NTU Singapore



UOT Japan



JHU USA



INST Mohali, India



DRDO Hyderabad, India



JNARDDC, Nagpur India



IISc Bangalore India



IIIM Lucknow India



KIT Germany



Hindustan Zinc Ltd



Navin Fluorine International Ltd



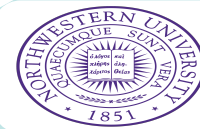
Zyme



Broadcast Wearables Pvt Ltd



Saint Petersburg State University



Northwestern University



HKUST



Grenoble INP, France



AMO GmbH Germany



OYO



Walmart



BNY



GE



Standard Chartered

Faculty Profiles

Dr. Rajiv Prakash
Professor & Dean (R&D)

Conducting Polymers & Composites,
Organic Semiconducting Devices,
Sensors & Biosensors and
Electroanalytical Techniques

Dr. Chandana Rath
Associate Professor

Nanomagnetics, Dilute Magnetic
Semiconductors, Multiferroics, Ion Irradiation,
Semiconducting Nanostructured Materials,
Ceramic nanocomposites and thin film

Dr. Chandan Upadhyay
Associate Professor

Ferroic and Multiferroic Materials,
Magnetism in Low Dimensional System,
Multifunctional Materials,
Organic Electronics

Dr. Ashish Kumar Mishra
Assistant Professor

Carbon and other layered nanostructures,
Electron microscopy, Raman Spectroscopy,
Energy devices, Design of sensors, Gas capture
units and water filters.

Dr. Sanjay Singh
Assistant Professor

Magnetic shape memory alloys, Caloric materials,
Magneto-structural transitions, Aperiodic
crystallography, X-ray and neutron diffraction,
Magnetism, Spintronics, Multiferroic Device

Dr. Pralay Maiti
Professor

Polymer Nanocomposites, Biomaterials,
Self-assembly, Biodegradable polymer, Polymer
for renewables, Radiation Resistance polymer,
Fuel cell membrane, Polymer electronics.

Dr. Akhilesh Kumar Singh
Associate Professor

Smart Materials, Structural Phase Transitions,
Synthesis and Characterization of Advanced
Ceramics

Dr. Bhola Nath Pal
Assistant Professor

Solution processed thin film and devices,
Colloidal quantum dot based
optoelectronics devices, Transparent
electronics, Low power consuming electronics

Dr. Shrawan Kr Mishra
Assistant Professor

Energy Efficient Quantum Materials and Phase
Change Materials, Magnetic Materials and
Confined Magnetism, Magnetic Memory Devices
& Spintronics, Charge, Lattice, and Spin Dynamics.

Why Us

Century Old Legacy

Upholding the revolutionary vision of Mahamana Malaviya Ji, IIT (BHU) takes pride in producing graduates who are not only turn out men as engineers, scientists, merchants, theologians but also as men of high character, probity and honour, whose conduct through life will show they bear the hall-mark of a great University.

Interdisciplinary Nature

Graduates have undergone a serious interdisciplinary learning experience in materials studies, crossing over the traditional boundaries of such classical disciplines as chemistry, physics, electrical, mechanical, microelectronic, ceramic and metallurgical engineering.

Practical Training

Along with the Research Projects, students have undergone rigorous industrial internships to improve their practical skills and have national and international exposure.

Modern Skillsets

IIT (BHU), Varanasi houses state-of-the-art facilities with World-Class Infrastructure, some even unique internationally, allowing students unparalleled exposure to the best investigational tools.

Vibrant Ambience

Outstanding Student Body has helped students to participate in a various national and international competitions of extracurricular and co-curricular activities honing their skills and talents.

Unique Discipline

It is one of the three IITs to offer courses exclusively in Materials Science from UG level, apart from IIT Kanpur and IIT Gandhinagar.

Research Culutre

The School of Materials Science and Technology along with its strong research base fosters the need for industries. Faculty members on a roll are well-networked and competitive internationally.

Great Exposure

The school has and also many Seminars and Workshops are organized from time to time from the eminent people, to expose the students to various facets of the industry, research labs and academia

Holistic Developement

While maintaining the highest levels of academic excellence, students are trained to align their research with national missions or to address problems that would improve the human condition, preparing them to be the leaders of tomorrow.

Past Records

Our graduates excel themselves at the top Universities/ research organizations/ manufacturing plants and business houses.

Major Past Recruiters



Paypal



Applied Materials



TCS



Reliance Jio



Axtria



Capgemini



Eaton



Tredence



Virtusa



ICICI Bank



Citi Bank



Xebia



Alphonso



Cisco

Contact Us

Dr. (Mrs) Chandana Rath

Coordinator
School of Material Science and
Technology
crath.mst@iitbhu.ac.in

+91-9451058153

Dr. Shrawan Kumar Mishra

Faculty Advisor
Training and Placement Cell

shrawan.mst@iitbhu.ac.in

+91-9129113336

Sakshi Vijay

Representative
Training and Placement Cell
sakshivijay.mst18@itbhu
.ac.in

+91-6377995949

Vedant Kadu

Representative
Training and Placement Cell
kvedant.bhanudas.mst19-
@itbhu.ac.in

+91-9403165325

Sayam Jain

Representative
Training and Placement Cell
sayam.milindkrjain.mst20
@itbhu.ac.in

+91-7046764641

Important Links:

Institute Website	_____	www.iitbhu.ac.in
Department Website	_____	www.iitbhu.ac.in/dept/mst
Training and Placement Website	_____	www.placement.iitbhu.ac.in
Training and Placement Email	_____	tpo@iitbhu.ac.in

Let us join hands and establish a symbolic relationship!