

DEPARTMENT OF METALLURGICAL AND MATERIALS ENGINEERING

IIT PATNA



PLACEMENT BROCHURE

Master of Technology(M. Tech) in Materials Science and Engineering (MSE) 2020-21

"A vital phenomenon can only be regarded as explained if it has been proven that it appears as the result of the material components of living organisms interacting according to the laws which those same components follow in their interactions outside of living systems."

— Adolf Eugen Fick

For us, an atom shall be a small, spherical, homogeneous body or an essentially indivisible, material point, whereas a molecule shall be a separate group of atoms in any number and of any nature.

— Marc Antoine Augustin Gaudin

From packaging materials, through fibers, foams and surface coatings, to continuous extrusions and large-scale moldings, plastics have transformed almost every aspect of life. Without them, much of modern medicine would be impossible and the consumer electronics and computer industries would disappear. Plastic sewage and water pipes alone have made an immeasurable contribution to public health worldwide.

— Norman C. Billingham



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From the HOD's desk

"The Department of Metallurgical and Materials Engineering (MME) at IIT Patna is endowed with world class facilities under a single roof which allow students to learn vital skills and obtain hands-on experience of latest technologies used both in industries and academia."

"This Department has pioneered a unified approach in teaching and research, which has enabled us to evolve into an interdisciplinary field catering to diverse applications."



The Department of Metallurgical and Materials Engineering (MME), earlier known as Materials Science and Engineering at IIT Patna was established in 2012.

From its inception, it has shown its strong impact in the areas of research as well as industrial exposure. The field of study in the Department encompasses areas of both traditional and modern Metallurgy and other allied systems of materials (e.g., ceramics, polymer, composites etc).

Our UG programme in Metallurgical and Materials Engineering has already commenced in July 2019. The PG programme (i.e., M.Tech. in Materials Science and Engineering), started in 2014, is more interdisciplinary in nature.

Along with metals and alloys, the Department focuses heavily on a variety of Materials like ceramics, polymers, intermetallics, composites, electronic materials and biomaterials.

The Department has reinvented constantly to keep the curriculum in pace with the state-of-the-art technologies. This Department has pioneered a unified approach in teaching and research, which has enabled us to evolve into an interdisciplinary field catering to diverse applications.

MME Department at IIT Patna is endowed with world class facilities under single roof which allow students to learn vital skills and obtain hands-on experience of latest technologies used both in industries and academia. Department is actively engaged with various funding agency like SERB-DST, ISRO, NRB, BRNS, Manali Petrochemical Ltd., Denka (Japan), Tata Steel Limited, MRF Tyres, Carborundum Universal Limited etc.

**Dr. Anup Kumar Keshri,
Head, Department of MME**

VISION

The Department aims to train students with the fundamentals and expertise in design, synthesis, characterization, testing and production of various materials and also with the knowledge of new technologies in production and processing of new and advanced engineering materials.

The Department continues to strive for excellence and develop continuously through progress and improvement to establish itself as one of the leading department of education and research.

The Department



The strong dependence of our society on metals and alloys makes metallurgy an important branch of modern engineering. Metallurgical and materials engineering involves design, innovate and improve the process; to transform to useful products we use every day in our life. It is a discipline that enables both the creation and application of materials in society. Also, Materials engineers develop materials for new applications, improve existing materials to enhance performance and evaluate ways in which different materials can be used together.

Department of Materials Science and Engineering was established in the year 2012 and was renamed as Department of Metallurgical and Materials Engineering in 2018. The Department focuses on the fundamental and engineering aspects of conventional metallurgy, materials and advanced materials.

The Department faculty specializes in the areas of physical and mechanical metallurgy, phase transformations, thermomechanical processing, electron microscopy, materials chemistry, nanomaterials, thin films and coatings, ceramic and metal matrix composites, tribology, thermal spraying, polymer science and technology,

fillers, composites, ultra-high temperature ceramics and phase field modeling. Apart from the regular teaching activities, the Department aims to train students with the fundamentals and expertise of design, synthesis, characterize, testing and production of various materials and also with the knowledge of new technologies in production and processing of new and advanced engineering materials.

The Department continues to strive for excellence and develop continuously through progress and improvement to establish itself as one of the leading departments of education and research.

The Faculty Members



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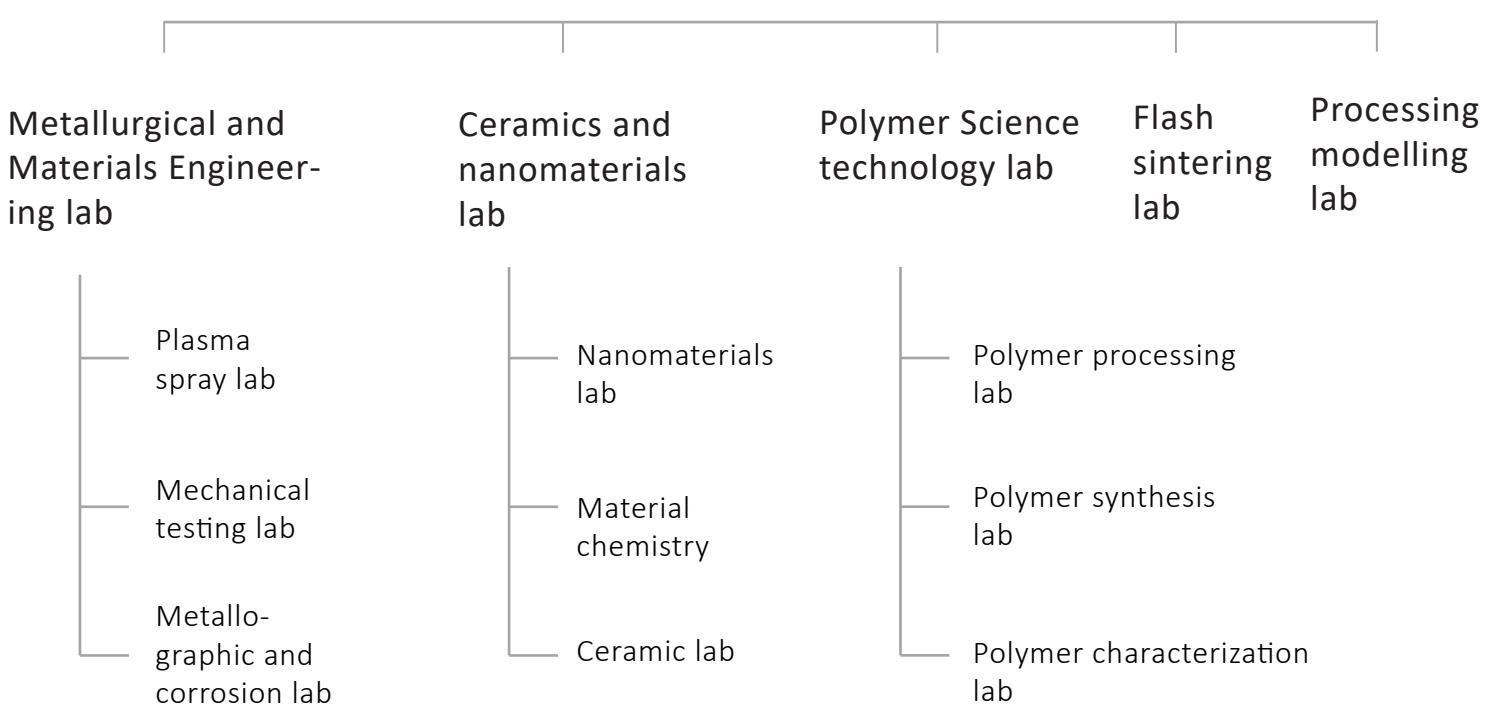
"It is the supreme art of the teacher to awaken joy in creative expression and knowledge."

- Albert Einstein

State of the Art Lab Facilities

“MME department in IITP is fully equipped with modern & sophisticated instruments for materials progressing characterisation, which makes students fully learned and gives them hands-on experience for both industries and academics.”

LABORATORIES



Coating Laboratory and Allied Labs



Acoustic chamber- inside view



Instrumented Hardness and Scratch Tester



Planetary Ball Mill



Powder Feeder



Low speed diamond saw



Tribometer



Shrouded Plasma Spraying



Spray Drier



High Speed Diamond Saw



Accuraspray



Helium Gas Pycnometer



Hall Flow Meter

Polymer Science and Allied Labs



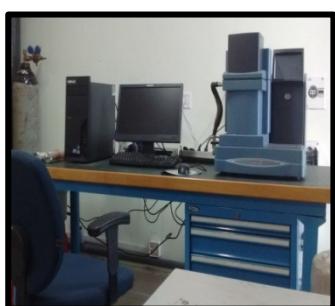
Haake Rheomix



Two roll mixing mill



Compression molding machine



Dynamic Mechanical Analyzer (DMA)



Fourier Transform Infrared Spectroscopy (FTIR)



Simultaneous Thermal Analyzer (TG-DSC)

Flash Sintering and Material Modelling Lab



Drum milling machine



Custom built furnace:
950 C



Weighing balance



Ultra Sonicator



Furnace temperature
with 1300 C



Polishing machine

Material Chemistry and Allied labs



Digital Ultrasonic Cleaner



Milli Q water purification system



Polishing machine



UV spectrometer



Jar mill



Spin Coater



Unidirectional Hydraulic Press



Fume Hood



NETZSCH DSC-TGA



RIGAKU XRD Diffractometer

Our Funders



Denka



Our Research scholars are working on various projects which were funded by government as well as private organizations like Tata Steel, ISRO, BHEL, Carborundum inc., Denka etc.

Points of Pride

- State of the art, **Plasma Spray Coatings Laboratory**, PSCL.

- Department fundings have increased by approx. **70.65%**, which talks about the growth of the department at a rapid rate.
- Department has filed **1 international** and **11 national** patents.
- Our alumni has excelled both in the field of **placements** and **research**.
- Our students have also bagged off campus placements and are **working at various R&D labs across India**. When it comes to research, our students are pursuing **research in various IIT, IISc, foreign universities like UBC Canada, etc.**

Achievements

12 Patents

Approx. fundings of

5.7 Crores

Journals include:

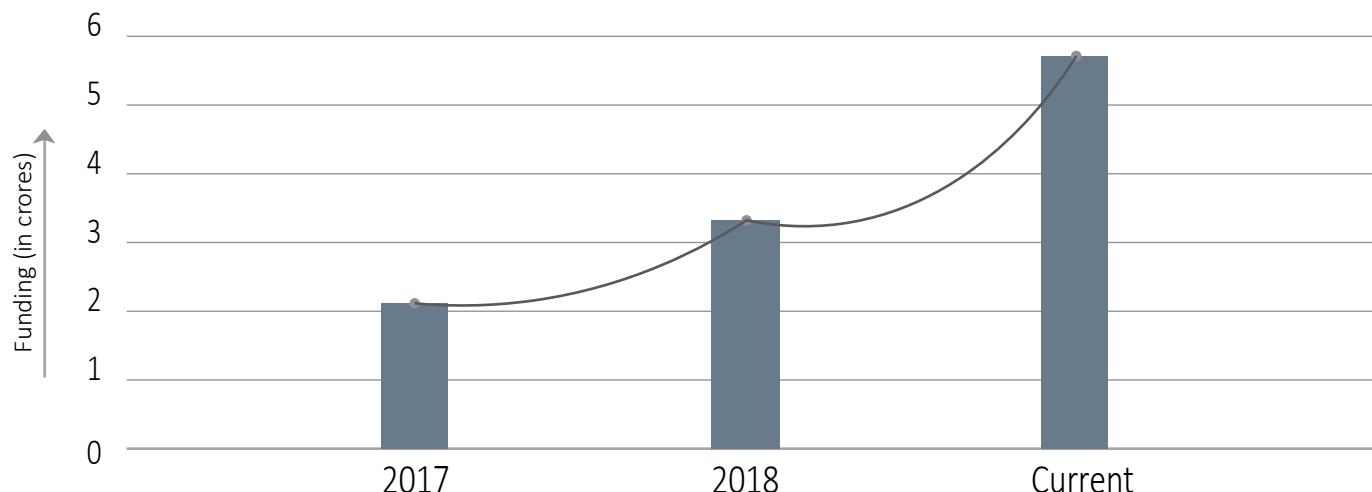
- | | |
|--|---|
| <ul style="list-style-type: none"> - Acta Materialia - Acta Biomaterialia - Composites Part B: Engineering - Electrochimica Acta - Scripta Materialia - European Polymer Journal | <ul style="list-style-type: none"> - Materials Characterization - Journal of Alloys and Compounds - Ultrasonics Sonochemistry - Applied Surface Science - Polymer - Journal of the American Ceramic Society |
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Publications

The Department has published over

160 Papers

in many renowned and prestigious journals.



Curriculum

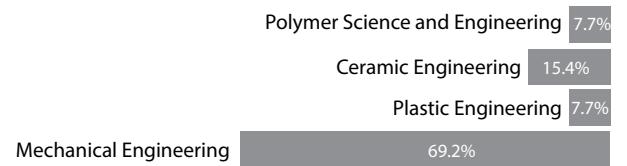
Materials Science and Engineering (MSE) is an interdisciplinary field of science and engineering which investigates the relationship between the structure, property and processing of materials useful for various influence its properties. It is a discipline that enables both the creation and application of materials in society. Materials scientists and engineers develop materials for new applications, improve existing materials to enhance performance and evaluate ways in which different materials can be used together. The M.Tech. degree is designed in a way to provide a holistic view on all the classes of materials including metals, ceramics and polymers. The program is intended to provide in-depth knowledge in the fundamentals, analysis and structure-property correlation of various materials system. There will be options also for taking elective courses from within and outside the department. Moreover, specialists from overseas and experts from industries will be invited to lecture for a few classes in selected modules



CORE SUBJECTS	ELECTIVE SUBJECTS	LAB COURSES
1. Nano-structured material	1. Thermodynamics and phase diagrams	1. Microstructure and phase analysis lab
2. Material processsing technology	2. Surface engineering	2. Materials Characterisation lab
3. Advance material characterisation techniques	3. Rubber science and technology	
4. Structural and functional properties of material	4. Alloy development and heat treatment	
	5. Composite science and technology	

Batch Profile Summary

Student distribution discipline wise PG Specialisation



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