

Materials & Manufacturing Technology (MMT)

M.Tech in Materials & Manufacturing Technology (MMT) integrates the materials and manufacturing fields to promote the present industrial requirement. The programme allows a compressive study in the advances in Composite materials, advanced solid mechanics, Structure property correlation of Engineering Materials, Processing of engineering materials, Nano structured materials-synthesis. The programme deeply concerns with the aspects of manufacturing design and analysis, simulation, planning and purchasing, cost accounting, scheduling, inventory control and distribution, product design, ergonomic design, product life cycle management, supply chain management, enterprise management. To achieve advance material and manufacturing MMT uses technologies like advance polymers and composites, heat treatment, designing, testing & characterization and selection processes, a business system integrated by a common database.

Scheme & Syllabus

The detailed revised syllabus is available in the following link.

http://www.nits.ac.in/departments/mech/syllabus/Course_MTech_Design_and_Manufacturing.pdf

Objectives & Activities

- The students will study latest subjects in the area of MMT with the objective of producing designers and manufacturing professionals.
- To provide hands on experience to the students on the state of- the-art knowledge-oriented machines and software tools for product design, rapid manufacturing, automation, quality assurance fit for the Industries.
- To develop the competency in the research activity to address the recent challenges in the industry and society.

Career Scope

- Core companies in design, manufacturing, assembly Aerospace Engineers, Agriculture, Biomedical, and Electrical/Electronics Engineers, Defence and automotive sectors.
- Software companies dealing in product design and development.
- Research and Development Organisations.

Eligibility Criteria

As per CCMT (Centralized Counseling For M.Tech./M.Arch./M.Plan. Admissions) guidelines.

Duration

- The duration of the course is 2 years comprising of 4 semesters
- First two semesters contains class work and labs.
- Third and fourth semesters have in house R & D project work.

Facilities

- High end computational facilities available for lab work and research purpose
- Hands on training are available on sophisticated manufacturing machinery (CNC controlled EDM, USM, 3D printer etc.)
- Financial support for project/research work through institute, department, TEQIP III funds.
- Central T&P cell Enable opportunities for job placement

List of laboratories and major equipment

- **Nano Composite Materials Lab:** This lab was exclusively for the preparation of composite as well as nanocomposite.
- **FRP Lab:** This lab was exclusively for the preparation of laminated composite and bio composites. Various instruments regarding the processing, sample preparation, degassing, curing as well as polishing in a semi-clean environment was established in the lab.
- **Mechanical Characterization Lab:** This lab was exclusively for mechanical and thermal characterization of the composite as well as nanocomposite polymers, metals, ceramics as well as adhesives.
- **Advanced Manufacturing Lab:** Advanced machines like CNC lathe, Die sinking EDM, Micro-EDM, Wire-EDM, USM, Chemical Machining, Optical Micro-scope, Surface profilometer, Scanning Electron Microscope (SCM).
- **Central Workshop:** Equipped with conventional machines like lathe, Milling, shaper, drilling, and hand tools for manufacturing/fabrication work.

Thrust Areas

1. Nano Composites
2. Functionalization of Nano materials
3. Bio composites and bio materials
4. Fatigue fracture analysis
5. Ceramic materials
6. Laminated composite structures
7. Functional graded materials
8. Additive Manufacturing
9. Phase change material for solar energy storage
10. Self-healing materials
11. Advanced manufacturing
12. Thermo mechanical processing of various grades of steels
13. Machinability of various grades of steels
14. MQL lubrication and dry machining

Placement details

Majority of the students have opted for higher study in premier institutes in India and abroad. Some of them are also placed in reputed industries after passing out from the institute.

Project and Publication details

There are presently eight nos. of projects being handled by the faculty members from the concerned area and a few of them have been completed successfully, so far. These are funded by various Govt. agencies, for e.g. DST-FIST, DST, NMHS, AR&DB, etc.

A number of patents have already been filed by faculty member of the concerned area and one of them has been granted till date. A few are in the publication stage.

Students and faculty members of the department have published more than 50 research papers and also a number of book chapters in reputed publishing house over the last few years.

For further information, contact

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