Department of Mechanical Engineering

Programmes and Facilities

Flexible Manufacturing System in the Department

NATIONAL INSTITUTE OF TECHNICAL TEACHERS TRAINING & RESEARCH

(Established by Ministry of Education, Govt. of India)

Sector 26, Chandigarh

INTRODUCTION

The department started functioning in 1967 when the institute was established by Ministry of Higher Education, Government of India, in collaboration with the Royal Dutch government. The department was established under the guidance of Dutch experts. Equipment in different areas of Mechanical Engineering and training to selected faculty of the department in Netherlands was provided. Presently, the department offers Post-Doctoral, Doctoral & Post graduate programs and short term training programs.

VISION

To provide world class services in education, training, research and consultancy in the select areas of manufacturing technology by strengthening competencies in the sub areas of computer aided design & manufacturing, modern manufacturing processes, engineering materials & material testing, 3D printing and mechatronics to help in growth and quality enhancement of technical education in the country.

POST GRADUATE PROGRAMS

- ***M.E. in Mechanical Engineering (Manufacturing Technology)***
- ***M.E. in Mechanical Engineering (Robotics)***

For M.E. programs the institute is affiliated with Panjab University, Chandigarh. Duration of the program is two years, in which 12 subjects are covered in first three semesters and fourth semester is dedicated to thesis work.

Ph.D PROGRAMS

- Ph.D. in Mechanical Engineering for M.E/M.Tech qualified candidates, faculty members and industry personnel
- Ph.D. in Mechanical Engineering for QIP sponsored candidates from Engineering and Polytechnics Colleges

For Ph.D program the institute is research center of Panjab University, Chandigarh and Punjab Technical University, Jalandhar. Also joint Ph.D., Post-Docs and International collaborations are encouraged for quality research work.

INDUSTRY CONNECT

Ph.D. and M.E. students are motivated to carry out their thesis/project work in industry along with Lab work. Solving real-life industrial problems hones their technical skills and liaisoning with outside world improves their soft skills. Some of the prominent industry/research organizations with whom the students are working or have worked are:

- Honda Motor Company Ltd.
- Ordnance Cable Factory
- CSIO, Chandigarh
- TBRL, Chandigarh
- MNIT, Jaipur
- Vikram Sarabhai Space Centre
- Vembsys Technovation, Gurgaon
- GADVASU, Ludhiana
- Central Mechanical Engineering Research Institute (MERADO), Ludhiana

SHORT TERM TRAINING PROGRAMS

The department conducts one / two week(s) short term training programs for the benefit of technical teachers/staff and professional engineers in following areas:

- Reverse Engineering & Additive Manufacturing
- Mechatronics, Automation & Robotics
- CNC Machines, Hybrid Machining
- Latest Trends in Automotive Engineering
- Computer Aided Design & Finite Element Analysis
- Material Characterization & Testing
- Optimization Techniques

LABORATORY & RESEARCH FACILITIES

The department has following very well equipped laboratories with state-of-the-art equipment.

- Automation and FMS
- Simulation Centre of Excellence
- Tribology & Condition Monitoring
- Mechatronics and Measurements
- Additive manufacturing
- Advanced Material Testing
- Modern manufacturing and Machine Tool
- Advanced Metrology

Some of the sophisticated equipment available in the department for practical work and R&D include:

- Digital Twin Set-Up
- Flexible Manufacturing System
- CNC Vertical Milling Machine
- High Performance Computing Workstations

- 3D Scanner
- Polymer, Bio-material and Metal 3D Printers
- Electric Discharge Machine
- Electro-Chemical Machine
- Scanning Electron Microscope
- Spectrometer
- Wear Measurement Test Rig
- Scratch Tester
- Vibration Analyzer
- Gear, Shaft & Bearing Test Rigs
- Nano-Coatings Electro-Deposition Setup
- Cryogenic Treatment Equipment
- Automotive ECU Setup
- PLC Controlled Fluid Power Systems
- Advanced Design and Analysis Software

RESEARCH PROJECTS

Department faculty and research scholars are engaged in working on research projects funded by industry and central government agencies. Following are the ongoing projects:

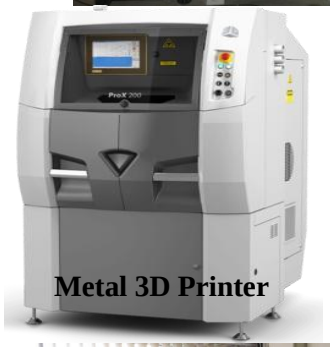
- *Development of Digital Twin of an Articulated Robotic Arm* (sponsored by AI & Robotics Technology Park, a joint initiative of IISc and AIfoundry)
- *Modeling & Simulation of Electromechanical Systems* (supported by ABB India, Bengaluru)
- *Barium titanate and graphene reinforced PVDF' matrix for 4-D applications* (supported by AICTE)
- *HAp reinforced biodegradable porous structures through polymer deposition technology for tissue engineering applications* (under ASEAN-INDIA science & technology development fund)

TESTING FACILITIES & RESOURCES

Department offers consultancy and testing facilities to industry and researchers. A number of online lectures, video films, etc. by department faculty are also available.

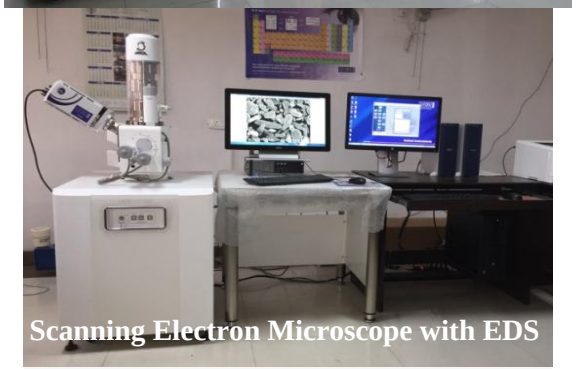
GLIMPSES OF AVAILABLE FACILITIES

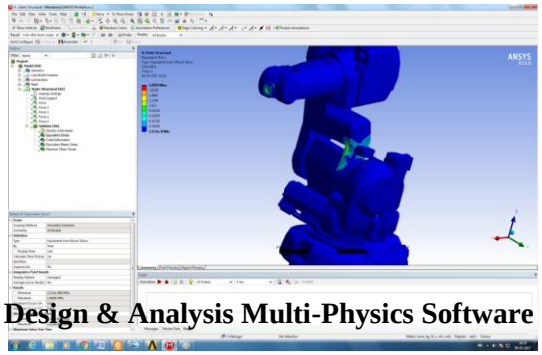
Vertical Machining Center


Metal 3D Printer


FDM Polymer Printer


CNC Turning & Milling Simulators


Scanning Electron Microscope with EDS


Design & Analysis Multi-Physics Software


High Performance Computing Workstations

FACULTY CONTACTS

The department has highly qualified faculty and well trained technical staff.

- **Dr. B. S. Pabla**, Professor, 0172-2759525, bsp@nitttrchd.ac.in
- **Dr. S. S. Banwait**, Professor, 0172-2759552, ssb@nitttrchd.ac.in
- **Dr. S. S. Dhami**, Professor, 0172-2759659, ssdhami@nitttrchd.ac.in
- **Dr. Rupinder Singh**, Professor & Head, 0172-2759780, rupindersingh@nitttrchd.ac.in
- **Er. S. D. Jassal**, Associate Professor, 0172-2759655, jassalsd@nitttrchd.ac.in
- **Dr. P. S. Rao**, Assistant Professor 0172-2759617, psrao@nitttrchd.ac.in