We are delighted to invite corporates to join the placement process at IIT Delhi. Students who have honed their skills in the rigor of Mechanical Engineering are now ready to make contributions as they look forward to the challenges of real life. We take pride in the quality of our programs and the potential of our students. They will be an asset for the companies they work for. We look forward to welcoming corporates to explore employment opportunities with our students.

“Department of Mechanical Engineering at IIT Delhi, an Institution of Eminence, is well known for its pursuit of excellence, reflected by its consistent QS rankings – in 2022, it is ranked 64th in the world. Students of the Department strive for excellence in academics as well as extracurricular activities. Our alumni make us proud with outstanding achievements in their pursuits in academia, industry and entrepreneurial ventures. On behalf of the Department, I welcome you to explore our talent pool of UG and PG / Ph.D. students, and I am sure you would be fully satisfied with their capabilities.”

Prof. M.R. Ravi
Head of The Department

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Prof. Bhupinder Godara
Faculty Coordinator
The Department of Mechanical Engineering at IIT Delhi is proud of its faculty members whose credentials are amongst the best anywhere in the world. With around 45 such faculty members and about 30 laboratories with cutting-edge equipment and research facilities, the department supports training manpower and solving research and industrial problems in all areas of mechanical engineering. Its B.Tech. and M.Tech. curricula are known for excellence internationally and are updated continually to stay on the cutting edge. No wonder, it attracts top-ranked students through the IIT-JEE for B.Tech. and GATE for M.Tech. / M.S. (Research) programs. B.Tech. is offered in Mechanical Engineering and Production and Industrial Engineering; M.Tech. is offered in Thermal Engineering, Mechanical Design, Production Engineering, and Industrial Engineering. M.S. (Research) and Ph.D. graduates are trained in cutting-edge research with the rigor that IIT Delhi stands for, and are capable of independent problem solving for industry and academia alike.

### Programs

1. **Bachelor of Technology**
   - Mechanical Engineering
   - Production and Industrial Engineering

2. **Master of Technology**
   - Thermofluids Engineering
   - Production Engineering
   - Industrial Engineering
   - Mechanical Design

3. **Master of Science (Research) / (MS(R)**
   - Mechanical Engineering

### Highlights

1. Among the Best Laboratory Infrastructure in Country
2. Rigorous Approach in Teaching
3. Faculty of International Acclaim
4. Comprehensive Curriculum

### Previous Recruiters

![Recruiters Logos](image-url)
Undergraduate Programs of the Department

There are two undergraduate degree programs offered by the department, namely i) **B.Tech in Mechanical Engineering**, and ii) **B.Tech in Production and Industrial Engineering**. Students begin their courses starting with institute core courses in basic sciences such as **Physics, Chemistry, Mathematics** to a wide range of engineering arts and sciences such as **engineering mechanics, computer science, environmental science, electrical engineering, engineering visualization to product realization, material science, numerical methods, statistics and humanities**. Then the move to program linked core courses which are specific to either degree as below.

### B.Tech. in Mechanical Engineering
- Solid Mechanics
- Fluid Mechanics
- Kinematics and Dynamics of Machines
- Manufacturing Processes
- Engineering Thermodynamics
- Mechanical Engineering Drawing
- Design of Machines
- Control Theory and Applications
- Energy Systems and Technologies
- Heat and Mass Transfer
- Introduction to Operations Research
- CAM and Automation
- CAD and Finite Element Analysis
- Manufacturing System Design
- Mechanical Engineering Laboratory

### B.Tech. in Production and Industrial Engineering
- Solid Mechanics
- Kinematics and Dynamics of Machines
- Metal Forming and Press Tools
- Near Net Shape Manufacturing
- Metrology and Quality Assurance
- Welding and Allied Processes
- Material Removal Processes
- Thermal Science for Manufacturing
- Mechanical Engineering Drawing
- Design of Machines
- Control Theory and Applications
- Stochastic Modelling and Simulation
- Introduction to Operations Research
- CAM and Automation
- Micro and Nano Manufacturing
- Industrial Engineering Laboratory
- Composite Materials and Manufacturing
In their 3rd and 4th year of the degree, B.Tech. students get a wide array of elective courses to choose from, which are typically oriented toward providing exposure to state of art research and industrial practices. A good number of these elective courses are available in the institute brochure. Along with this, students gain practical experience from summer internships to industry and also at foreign universities, non-graded units and summer research fellowships to directly work on research projects in the department, various clubs such as the Robotics Club, Aero-Modelling Club, F1 Racing Club, etc.

There are rigorous laboratory classes in their 3rd and 4th year to promote hands-on learning and enhance practical experience. In their final year, students do semester-long B.Tech. projects where they directly get involved in an actual faculty research and industrial design work, which prepares them for taking design and creation work and familiarizes them with finer details involved in the execution of a practical project.

The outcome of the undergraduate program is to prepare the student to

- Build on fundamental education in physics, mathematics and chemistry, then apply those principles to arrive at the solution of open-ended engineering problems
- Work effectively as part of a team; plan, organize, manage and communicate effectively
- Understand the broader impacts of engineering developments and apply ethical, societal, cultural, and environmental concerns considerations in a project
Ph.D. and MS(R) in Mechanical Engineering

There are two research programs offered by the department, namely Doctor of Philosophy (Ph.D.) and Master of Science by Research (MS(R)). Although typically the broad areas of research align with the four verticals of the M.Tech. specializations shown above, the research programs can cut across boundaries to be truly interdisciplinary, even across the departments or institutions. The award of the Ph.D. degree is in recognition of high achievements, independent research and application of scientific knowledge to the solution of technical and scientific problems. The MS(R) program provides higher flexibility and independence in conducting a research project compared to a regular M.Tech. program. The creative and productive inquiry is the basic concept underlying the research work.

These programs in Mechanical Engineering prepare students for careers in research and academia. Our collaborative faculty are investigating a diverse range of research areas like additive manufacturing, air quality, biomechanics, transport and propulsion, combustion and fire research, energy conversion and storage, computational design, DNA origami, nanoscale manufacturing, soft robotics, transdermal drug delivery, transport phenomena, machine learning, artificial intelligence, etc. Many of the research projects are sponsored by the industry and government-sponsored agencies.

Some of the ongoing research projects

- Bio-inspired design of electrospun poly(acrylonitrile) and novel ionene-based nanofibrous mats as highly flexible solid state polymer electrolyte for lithium batteries
- Steel/UHMWPE composite armor system against hardened steel core projectiles
- PLA-based candidate materials for cardiovascular stents in a rat subcutaneous implant model
- An inexpensive microfluidic device for 3-D hydrodynamic focusing in imaging flow cytometry
- Development of stabilization methods using a pilot scale anaerobic digester for seasonal variations in kitchen wastes for improved methane production with zero breakdowns
Ph.D. and MS(R) in Mechanical Engineering

Contd...

Some more projects

- Determination of thermal resistance at the mold-strand interface due to shrinkage in billet continuous casting—development and application of a novel integrated numerical model
- Fracture behavior and reliability of low-silver lead-free solder joints
- Investigation, modeling, and validation of material separation mechanism during fiber laser machining of medical-grade titanium alloy Ti-6Al-4V and stainless steel SS316L
- Modular framework for dynamic modeling and analyses of legged robots
- Use of solid lubricants like graphite and MoS₂ to improve grinding of Ti-6Al-4V alloy
- The influence of ultrasonic vibrations on material removal in the silicon wafer polishing using DDCAMRF: Experimental investigations and process optimization
- Statistical modeling and optimization of print quality and mechanical properties of customized tubular scaffolds fabricated using solvent-based extrusion 3D printing process
- Experimental investigations for tribo-dynamic behaviors of conventional and texture raced ball bearings using MoS₂ blended gases
- Development of Improved Furnaces for Hand-tool Clusters in Jalandhar and Nagpur

Skills learnt

Hands-on work with cutting-edge scientific equipment, design and development of experimental setups in house with help of simulations for the design, advanced numerical simulations to reveal deeper insights into physics and proposition of newer theoretical/computational model pushing boundaries of current science.
Strengths

- Thermal Design
- Microfluids
- Ref. & A.C.
- Computational H.T.
- Power Generation
- Combustion Analysis
- Propulsive Technology
- Energy Storage System

**Thermofluids Engineering**

Thermofluids Engineering is built on subjects of fundamental interest – Thermodynamics, Fluid Mechanics, and Heat Transfer, and trains the students in both experimental and computational methods of analysis and problem-solving. The inherent flavor of the faculty expertise ensures building capabilities of students in various applications built on this solid foundation – Combustion, I.C. Engines, Steam and Gas Turbines, Heating, Ventilating and Air-Conditioning (HVAC), Energy conversion and storage – including thermal storage and batteries, electronics cooling, microfluidics, thermofluids of phase change, etc. The students are trained on state-of-the-art experimental facilities and computational software and hardware, and are future-ready – they can adapt quickly to changing requirements of their working environment.

**Production Engineering**

The Production Engineering (PE) course curriculum and academic research projects are not only industry driven, but also cover aspects such as analysis, design, simulation and automation in addition to conventional manufacturing technologies. The program is committed to nurture able professionals in the fields of Optimization of Manufacturing Process, Process and Product Planning, Supply Chain Optimization, Mathematical & Physical Modelling of Manufacturing Processes, Additive Manufacturing.

**Strengths**

- Production Planning and Scheduling
- Automation
- Simulation
- Additive Manufacturing
- Finite Element Analysis
- Composites

**Thermofluids Engineering**

- **Industrial Engineering**

  Industrial Engineering (IE) is a highly specialized Techno-Managerial area which integrates the entire organization as a single entity. Industrial engineers are system integrators who focus on end-to-end solutions and use specialized knowledge and skills in the mathematical, physical, and social sciences, together with the principles of engineering analysis, to predict and evaluate the results obtained from systems and processes. Broad areas of application are in Manufacturing Systems, Supply Chains, Analytics, Machine & Deep Learning, Forecasting, Logistics, Transportation, E-Commerce, Finance, Services, Health Care, and other major industrial operations.

**Mechanical Design**

Mechanical Design focuses on the modern practices of design and engineering of machinery. This PG program comprises of comprehensive coursework followed by a rigorous research project in areas such as Robotics, Advanced Mechanisms, Active Noise Control, Fault Diagnosis of Machinery, Rotor Dynamics, Impact Biomechanics, Medical Devices, Automotive Safety, Human Body Modeling, etc. It mainly deals with the analysis, design, simulation and control of mechanical equipment/process. It emphasizes on application-based R&D projects with exposure to both simulation and experimentation.

**Strengths**

- Finite Element Analysis
- Vibration and Noise Condition Monitoring
- Tribology, Bearing & Rotor Dynamics
- Advanced Mechanisms
- Robotics and control
- Human Body Modeling
- Crash Safety & Design
- Impact Biomechanics
M.Tech. in Thermofluids Engineering

**Major Courses**
- Advanced Thermodynamics
- Advanced Fluid Mechanics
- Advanced Heat and Mass Transfer
- Applied Mathematics for Thermofluids
- Combustion
- Computational Heat Transfer
- Experimental Methods
- Design of Wind Power Farms
- Gas Dynamics
- Heat Exchangers
- Heating, Ventilating and Air-conditioning
- Micro/nano scale heat transfer
- Steam and Gas Turbines
- Thermal Design
- Turbocompressors

**Ongoing PG Projects**

**Thermal Design | Optimization**
- Development of dynamic lift and drag models for wind turbines
- Design and fabrication of an experimental test rig for combustion dynamics studies
- Design and development of Advanced Turbine blades

**CFD | Experimental | Combustion**
- Computational modeling of dispersion of SARS-COV2 in indoor spaces
- Study on combustion of a Swirl-based Dual Fuel Combustor
- Numerical model for analysis of Lithium-Sulfur batteries
- Numerical stimulations of Electrodynamics Jetting
- Numerical modelling of Atomization in Injectors
- CFD Simulation of porous media with conduction and convection

**Renewable Energy | Fluids | Heat Transfer**
- Modelling of Joule-Thompson Miniature Coolers
- Modelling and analysis of Electric Hybrid Vehicles running on Indian Urban Driving Cycle
- Modelling of combustion of Biomass Agricultural Residues

**Applied Fluids Dynamics | Heat Transfer**
- Study of continuous deposition of liquid thread onto a moving substrate
- Innovative techniques to capture PM 2.5
- Effective friction factor of zero shear stress surfaces
- Effect of wind gust on the aerodynamics of wind turbines
- Flame acceleration and accident hazard in partially confined geometries

**Software & Tools**
- COMSOL
- OpenFOAM
- MATLAB
- Ansys Fluent
- PTCCreo
- ICEMCFD
- Basilisk
M.Tech. in Production Engineering

Software & Tools
- PTC Creo
- MATLAB
- CATIA
- AutoCAD
- Dynaform
- LS Dynamics
- Solid Works
- Abaqus
- ANSYS
- Siemens NX
- Moldflow

Major Courses
- Additive Manufacturing
- Automation in Manufacturing
- Computational Methods
- Computer Aided Manufacturing
- Finite Element Methods
- Machining Processes and Analysis
- Mechanics of Composite Materials
- Metal Forming Analysis
- Metrology
- Welding Science and Technology

Ongoing PG Projects

Automation | Fabrication
- Machine health monitoring for Predictive Maintenance using Machine Learning
- Development of Machine OS for Smart Manufacturing
- Development of Cyber Physical Robotic Welding System

Nano Mechanics | Surface Engineering
- High speed end milling of super alloys using Nano-fluids
- Microcellular Extrusion/ injection molding of polymers -for light weight industrial solutions
- Diffusion bonding with potential interlayers

Composites | Simulation | Fabrication | FEA
- Fabrication and testing of bullet and blast resistant solutions
- Development of high aspect ratio structures on quartz for bio sensing applications
- Laser machining of thin metals and polymers for biomedical applications

Additive Manufacturing
- Design and Fabrication of functionally graded material
M.Tech. in Mechanical Design

Major Courses

- Advanced Mechanisms
- Analytical Dynamics
- Automotive Design
- Continuum Mechanics
- CAD & FEA
- Control Engineering
- Design & Optimization
- Design of Precision Machines
- Designing with Advanced Materials
- Experimental Modal Analysis
- Robotics & Multibody Dynamics
- Lubrication
- Rotor Dynamics
- Vibration & Noise Engineering

Ongoing PG Projects

CAD| Finite Element Analysis |Simulation

- Dynamic Mechanical Behavior prediction of nanostructures using MD Simulation
- Impact behavior of automotive joints
- FE model updating with experimental natural frequencies data
- Estimating Energy absorbed in a deformed mesh
- Importance of using personalized Human Body FE model in injury prediction in impact scenarios
- Origami inspired smart structures

Experimental | Design and Optimization

- Studying blast injuries for lying down vs. standing persons & Experimental study of effectiveness of blast mitigation materials
- Design & development of surgical aids for suturing
- Design, development and testing of a high damping ball bearing
- Design and analysis of a composite energy absorber based on shape memory polymer
- Study of injuries in lower extremities due to mine blast with anti-mine boot

Vibration & Noise | Robotics and Control Analytical Study | Computational Code

- Design and Development of Hold-Down Mechanism for vibration isolation (ISRO)
- Bio-tribological study of polymeric composite for hip-knee joint prosthetic applications
- Isolation system for satellite transportation Container suspension system
- Attitude control using a novel control law
- Biomechanical analysis of lower-limb exoskeleton
- Mobile Robot Manipulator Dynamics and Control
- Development of a digital twin for health monitoring of a gearbox
- Hold Down Mechanism for vibration isolation platform used for onboard satellite application
- Multibody Dynamics (MBD) Approach to Rotor Systems
- Gearbox health monitoring (Funded by ARDB)

Software & Tools

- Hyperworks
- MATLAB
- Abaqus
- Solidworks
- Autodesk Inventor
- PTC Creo
- LS-DYNA
- RecurDyn
- Madymo
- Adams
- ANSYS
M.Tech. in Industrial Engineering

Major Courses

- Probability & Statistics
- Operations Research
- Advanced Operations Research
- Supply Chain Management
- Project Management
- Industrial Engineering Systems
- Operations Planning & Control
- Reliability, Availability & Maintainability
- Entrepreneurship
- Project Management
- Value Engineering & Life Cycle Costing
- Logistics
- Stochastic Modelling & Simulation
- Maintenance Planning & Control

Ongoing PG Projects

Analytics

- Case Flow Management for Judiciary
- Revenue Management in the hotel industry
- Food grain Supply Chain Optimization for Uttarakhand & Rajasthan Central State Public Distribution system
- Health Systems optimization including Vaccine Supply Chain, CHC and PHC modelling

Transportation

- Efficient operations for city-bus system including Bengaluru Metropolitan Transport Corporation (BMTC)
- Creation of heuristic for reducing computational time for electric bus route allocation model
- Optimization of the existing schedule of BMTC buses by reducing overlapping schedules and including consistent headway
- Finding the weightage of attributes that contributes to bus service by using AHP and finding relative importance of these attributes by using logit model for different socio economic and demographic categories

Scheduling & Optimization

- Election schedule optimization modelling
- Optimization of kidney allocation policies and transportation system
- Simulation Modelling of liver allocation and transplantation

Skills Learnt

- Automated Data Downloading
- Data Cleaning and Preparation
- Data Basing
- Data Visualization
- Data Analysis & Exploration Modelling
- ML techniques & Statistics
- Dashboards & Reporting
- Transportation
- Optimization
- Linear/Non-linear/Integer Programming
- Discrete Event Simulation
- AHP
- Complex problem-Solving Skills

Applications

- Supply Chain Management
- E-Commerce
- FMCG
- Transportation
- Logistics
- Project Management
- Quality Management
- Health Care
- Production & Manufacturing
- Banking Sector

Software & Tools

- Excel
- Python
- SQL
- MATLAB
- IBM CPLEX
- Java
- Anylogic
- Tableau
- PowerBI
- AWS/Cloud Computing
- Hadoop
- Minitab
- SPSS
- R
- HTML

IE Tools

- Lean Six Sigma
- 7 QC Tools
- SWOT Analysis
- Poka-Yoke
- BPR
- S &OP
- DDMRP
- IBP
- KaiZen
- Kano’s Model
- Kanban
- Value Stream Mapping (VSM)
- Analytic Hierarchy process (AHP)
The department houses over 29 different lab facilities that are equipped with the latest cutting edge technology and encompasses all aspects of mechanical engineering.

**Mechanical Design**
- Vibration & Instrumentation Lab
- Design Research Lab
- Dynamic Impact Lab
- Mechatronics Lab
- Impact simulation Lab
- Vibration Research Lab
- CAD and Graphics Lab
- Mechanics & Materials Characterization Lab
- Program for Autonomous Robotics Lab

**Thermofluids Engineering**
- Thermofluids Engineering
- Combustion Research Lab
- Heat Transfer Research Lab
- I.C. Engines Lab
- Micro and Nano Fluidics Lab
- Thermofluids and Energy Systems Lab
- Cool -Tech (Cooling Technologies) Lab
- Fire Research Lab
- Turbomachinery Lab

**Industrial Engineering**
- Public Systems Lab
- Supply Chain Optimization Lab
- United Nations World Food Programme projects
- State of the Art optimization solvers
- Flexim, Anylogic, AI Capabilities

**Production Engineering**
- Production Engineering Lab Automation Lab
- Flexible Smart Manufacturing Lab
- Rapid Prototyping Lab
- CNC Lab
- Machine Tool Lab
- Computer Aided Graphics Interface Lab
- Design Manufacturing Lab
- Welding Lab
Interested companies contact Faculty Coordinator or placement officer, Office of Career Services (OCS) for a Job Notification Form (JNF) at placement@admin.iitd.ac.in

JNF requires the companies to fill in mandatory details of the job profile – role offered, pay package, place of posting, eligible departments.

Once the filled-in-JNF with all the required details is received, companies are assigned username/password to access their online account on OCS website.

Companies are also assigned space on the server on which they may upload any presentation, videos, data or other information they want the students to see.

The JNF has to be frozen on the OCS website by the company till a deadline, after which the students shall be able to view all the details, and the eligible students may apply.

After the application deadline for the students, the resumes are visible to the company. The company submits shortlist on its online account before a deadline.

Shortlisted students get notified. The placement office allots the dates for the campus interviews.

After the completion of the selection procedure on campus, company is required to announce the final list of the students on the same day itself.

If a student is selected, the job is registered against him/her and he/she would not be allowed to appear for more interviews as per placement policy.

Looking forward to fruitful professional relationship.............Welcome to Campus!
Contact Us

Placement Office: placement@admin.iitd.ac.in
Department Website: https://mech.iitd.ac.in

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