Welcome

Dr. Sanjeev Sanghi
Head of Department, Applied Mechanics

“The Applied Mechanics department offers a unique combination of courses in its M Tech. programme. The students get a firm grounding in the fundamentals related to the areas of Fluid Mechanics, Materials Science and Solid Mechanics along with rigorous training in the use of current analytical, experimental and computational tools. This equips them to analyse complex engineering systems and undertake their design with proficiency.”

Dr. Sawan S Sinha
Professor In charge T&P, Applied Mechanics

“The students graduating from our department are among the brightest in the nation and are well trained in various cutting-edge technology domains. They have achieved top positions in various leading organizations in the past and are always highly sought-after by leading organizations worldwide owing to the level of skills they acquire at IIT Delhi. I welcome the recruiters for the campus placement and I am confident that you will find exceptionally talented engineers for your organization.”
About Us

Department of Applied Mechanics was established in 1964 with a perspective of being a specialized branch involving teaching, research and consultancy works. Various national and international collaborative projects are being undertaken by the faculty of the department. Students of the department can deal with a wide range of technical and on-field challenges through the experience that they gain from our industrially-oriented projects.

Programs Offered: Master of Technology in Engineering Analysis and Design
Master of Science (Research) in Applied Mechanics.

Admission Criteria: Students with a minimum of 99 percentile in GATE are shortlisted followed by a separate written test. The two-stage rigorous selection process ensures that only the best and the brightest make it to the department.
There are three broad focus areas (and the respective basket of courses) available to M.Tech. Students

PRODUCT DESIGN
- Project Feasibility
- Product Design
- Design Methodology
- Design Optimization
- Finite Element Analysis
- CAD & CAM
- Product Reliability
- Failure Analysis and Prevention

SOLID MECHANICS
- Composites
- Failure Analysis
- Dynamics and Vibrations
- Metal Forming Analysis
- Finite Element Analysis
- Large Deformation
- Modelling & Analysis
- Smart Materials
- Bio-mechanics

FLUID MECHANICS
- Fluid Structures Interaction
- Turbulence Modelling
- CFD
- Thermal Analysis of flows
- Hydrodynamic Instability
- Industrial Aerodynamics
- Multi phase Fluid Flows
- Pipeline Engineering
- Flow diagnostics
Academics
Design Engineering

This stream has been consistently attracting bright students and is one of the most popular M. Tech. programs among the students as well as recruiters. Product design is becoming increasingly interdisciplinary, requiring the knowledge of electronics, instrumentation etc. in addition to solid mechanics, fluid mechanics and material science. Students take a wide range of specialized elective courses which enable them to successfully design and develop products.

Important Courses

• Product Design & Feasibility
• Design Optimization
• Finite Element Methods
• Modelling and Analysis of Mechanical Systems
• Fracture Mechanics
• Properties & Selection of Materials
• Continuum Mechanics

• Advanced Fluid Mechanics
• Mechanics of Composite Material
• Advanced Dynamics
• CAD
• CFD
• Product Reliability & Maintenance
## Ongoing Projects (Design Engineering)

<table>
<thead>
<tr>
<th>Simulations based on commercial FEA, CFD and other packages</th>
<th>Simulations with self written codes</th>
<th>Experimental and Fabrication related projects.</th>
</tr>
</thead>
</table>
| • Impact behavior and reliability assessment of light weight composite armors.  
• Design and Analysis of Lightweight electric motorcycle frame.  
• Impact Analysis and Optimization of Motorcycle Helmet.  
• Flutter and divergence analysis of vertical axis wind turbine.  
• Residual stress analysis of welded vessel joints with random system properties. | • Computational Design of human foot for deformity correction.  
• Product design of a novel mini screw dental implants.  
• Modeling and design of smart material based artificial muscle actuators. | Design of moving belt for dispersion studies in a wind tunnel.  
• Design of magnetostrictive material based energy harvesting device.  
• Design of soft actuators  
• Design, fabrication and testing of Unmanned Underwater Vehicles and Unmanned Aerial Vehicles  
• Automated optimal evaporative room cooling system. |
Engineering Mechanics

A broad area of Applied Mechanics, which focuses on research, analysis and development of computational and experimental tools for solving problems in areas of solid mechanics and fluid mechanics. Students of the department are equipped to deal with a wide range of technical and on-field challenges through the experience that they gain from the research as well as our industrially-oriented projects. The research and project works are intended at giving thrust to the development in the areas of:

**Solid Mechanics**
- Dynamics and Vibration
- Nonlinear Finite Element Analysis
- Light Weight Structural Materials
- Failure Analysis

**Fluid Mechanics**
- Turbulence Modelling
- Computational Fluid Dynamics
- Pipeline Engineering
- Fluid Structure Interaction

**Important Courses**
- Finite Element Analysis
- Theory of Plates and Shells
- Advanced Dynamics
- Advanced Solid Mechanics
- Applied Elasticity and Plasticity.
- Physics of Turbulence
- Continuum Mechanics
- Computational Fluid Dynamics
- Advanced Fluid Mechanics
- Turbulence & its Modelling
- Fracture Mechanics
- Mechanics of Composites
- Advanced Finite Element Method
# Ongoing Projects (Engineering Mechanics)

<table>
<thead>
<tr>
<th>Computational Modelling and Analysis using in-house code</th>
<th>Simulation using commercial FEA and CFD packages</th>
<th>Experimental Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Modeling of magneto-electro-elastic membranes for soft actuator applications.</td>
<td>- Extension-torsion-inflation coupling in compressible electro elastomeric thin tubes.</td>
<td>- Turbulent dispersion of pollutants in an urban environment</td>
</tr>
<tr>
<td>- Finite Element Analysis and DVC studies of Femur Bone</td>
<td>- Study of wrinkling instability in magnetoelastic membranes for soft actuator applications</td>
<td>- Analysis of pre- and post-heating effect on the residual stress distributed in welded vessel joint.</td>
</tr>
<tr>
<td>- Development of computer program for generating heat balanced diagram of thermal power plants.</td>
<td>- Musculoskeletal Modelling and Simulation of movement for human upper limb</td>
<td>- FE modelling and experiments on impact of 3D composites.</td>
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<tr>
<td>- Asymptotic modelling of pneumatic elastomers</td>
<td>- Static analysis of shape memory polymer plates</td>
<td></td>
</tr>
</tbody>
</table>
Research Facilities

- Computational Fluid Dynamics Laboratory
- Fluid Mechanics Laboratory
- Strength of Materials Laboratory
- 3D Printers
- Laser Cutter Machine
- Gas Dynamics Laboratory
- Stress Analysis Laboratory
- Experimental Method and Analysis Laboratory
- Impact Mechanics Laboratory
- Computational Laboratory
- Well-equipped Workshop
Softwares
Sample Design Projects

- Integrated 8 stationed open gym
- Foldable bicycle
- Shoe Drier
- Staircase Climbing Aid
Past Recruiters

Mercedes-Benz  
Boeing  
GM  
CAT  
Cummins  
IndianOil

Schlumberger  
OCEANEERING®  
SIEMENS  
APPLIED MATERIALS®  
HAVELLS

Atlas Copco  
EATON  
ANSYS®  
ALTAIR  
BOSCH

Hero  
BAJAJ  
Mahindra  
ASHOK LEYLAND  
RENAULT NISSAN MITSUBISHI

Capgemini  
TATA CAPITAL  
ELGI  
Kalyani  
Bharat Forge

Tata  
LT  
Sonalika International  
Agnikul
Recruitment Procedure

Process

✓ Student in-charge or placement officer, Training and placement cell shall provide the company a job notification form (JNF)

✓ JNF requires details of the job offer - role offered, pay package, place of posting, eligible department

✓ Once the filled-in JNF with all required details is received, companies are assigned username/password to access their online account at http://tnp.iitd.ac.in

✓ Companies are also assigned space on the server on which they may upload any presentation, videos, data or other information they want the student to see
Recruitment Procedure

Process

- The JNF has to be frozen on the OCS (formally T&P) website by company till a deadline

- Student shall be able to view all the details, and the eligible candidate may apply

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

- Short-listed students get notified
Recruitment Procedure

Process
✓ The placement office allots the dates for campus interviews

✓ After the completion of selection procedure on campus, company is required to announce the final list of the students on 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

Resume Verification
✓ All claims made by students in resumes submitted for campus placement are duly verified by the Placement Office. The verification standards are uniform throughout the Institute.
Contact us

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