

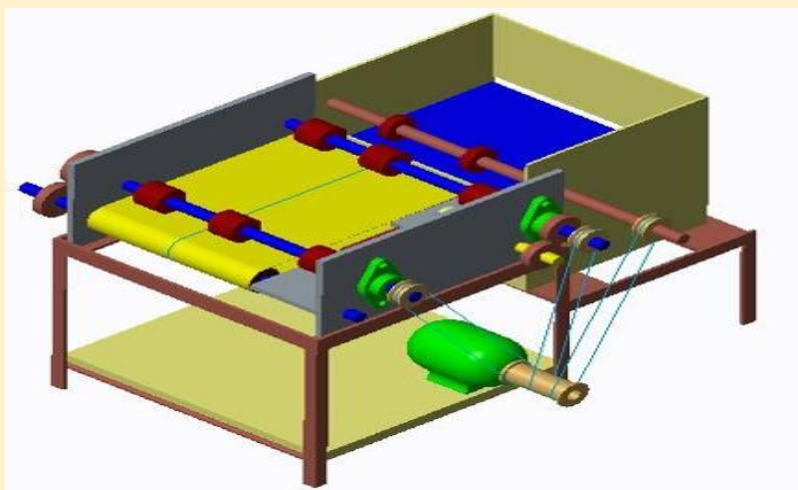
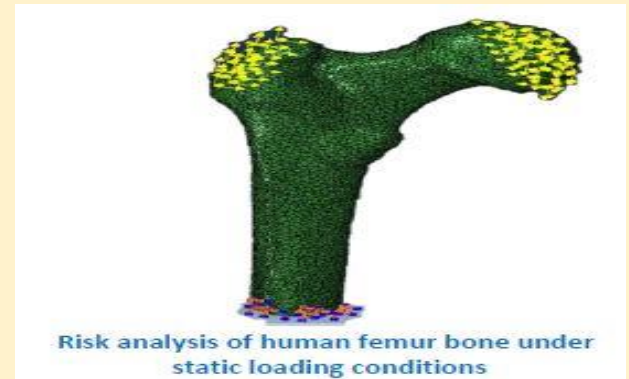
**Design Engineering Programme:** This programme has been consistently attracting bright students, and is one of the most popular M. Tech. programs of the Institute among the students as well as industries. Product design is becoming increasingly interdisciplinary, often requiring the knowledge of electronics,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

<b>Important Courses:</b>	1. Product Design & Feasibility	2. Finite Element Methods	3. Advanced Dynamics
	4. Advanced Solid Mechanics	5. Product Reliability & Maintenance	6. Design Optimisation
	7. Fracture Mechanics	8. Continuum Mechanics	9. CAD
	10. Properties & Selection of Materials	11. Advanced Fluid Mechanics	12. CFD

**SOME ON-GOING M.TECH PROJECTS**

❖ **Simulations based on commercial FEA,CFD and other packages**

- Modified design of miniature specimen test setup and prediction of mechanical properties of metals using hybrid (exp+FEM) techniques.
- Low velocity impact on woven fabric composites (exp+simulation).
- Reliability assessment of light weight composite armours.



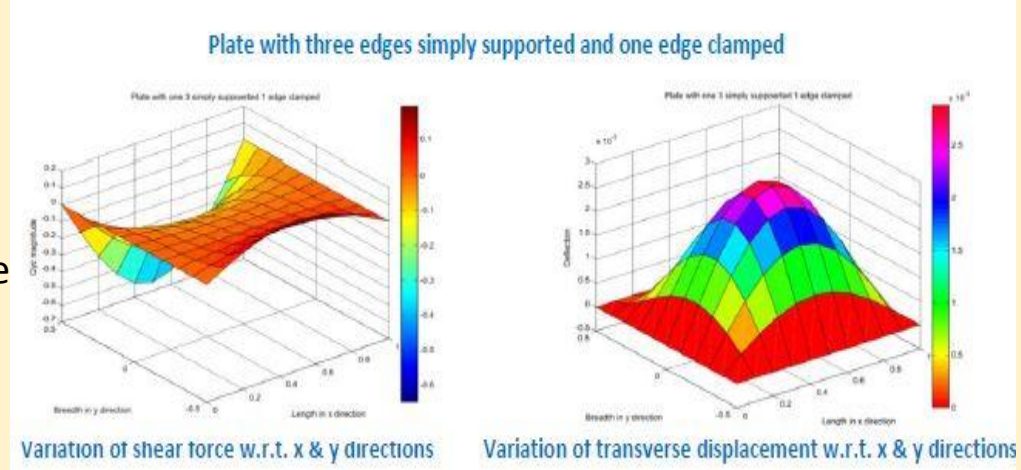
Design of ENVELOPE SEALING MACHINE

❖ **Simulations with self-written codes & verification by FEA packages**

- Dynamics of steel truss bridges.
- Optimization of fibre angle distribution of curvilinear fibre composites.
- Energy harvesting using smart materials.
- Residual stress analysis in welded vessel joints.

❖ **Experimental & Fabrication related projects**

- Impact on airborne structures.
- Design, fabrication and testing of binary flow control valve
- 3D printer design for medical prototype printing.
- Fabrication & test flight of a remotely controlled airship.



**DESIGN ORIENTED COURSES:**

Design Optimisation	Product Design & Feasibility	Finite Element Methods	Product Reliability
<p>This course focuses on optimizing an objective function involving multiple variables and constraints.</p> <ul style="list-style-type: none"> <li>✓ It focuses on formulating objective functions of product that has been developed as part of product design course.</li> <li>✓ Optimizing the objective functions for various constraints.</li> </ul>	<p>This course aims at developing a product which has utility in society or industrial application.</p> <ul style="list-style-type: none"> <li>✓ Need analysis and targeting a problem keeping in focus the end user.</li> <li>✓ Developing alternate designs in CAD modelling softwares such as CATIA, SOLID WORKS, CREO.</li> <li>✓ Fabrication &amp; Testing.</li> </ul>	<p>This course focuses on formulation of finite element model.</p> <ul style="list-style-type: none"> <li>✓ Writing own finite element code in MATLAB.</li> <li>✓ Automated pre- and post-processing.</li> <li>✓ Comparing FEM results with analytical results.</li> </ul>	<p>The main objectives of this course are</p> <ul style="list-style-type: none"> <li>✓ To understand the probabilistic and reliability analysis techniques.</li> <li>✓ To understand the importance of quantifying the risk involved in any practical problem.</li> <li>✓ To facilitate the decision of most sensitive design parameter which considerably affects the risk involved in the problem.</li> </ul>