



**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY KAKINADA**  
**KAKINADA – 533 003, Andhra Pradesh, India**

**DEPARTMENT OF MECHANICAL ENGINEERING**

<b>IV Year - I Semester</b>		<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
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<b>FINITE ELEMENT SIMULATION LAB</b>					

**The objective of this lab is to familiarize finite element simulation soft tools for the following applications:**

1. Determination of deflection and stresses in 2D and 3D trusses and beams.
2. Determination of deflections component and principal and Von-mises stresses in plane stress, plane strain and Axisymmetric components.
3. Determination of stresses in 3D and shell structures (at least one example in each case)
4. Estimation of natural frequencies and mode shapes, Harmonic response of 2D beam.
5. Casting processes - Study of Solidification, temperatures, Residual stresses, metallurgical phases etc.
6. Forging processes - Study of cold working and hot working processes for extrusion, drawing, rolling, etc.
7. Forming Processes – Study of blanking, bending, deep drawing, etc.
8. Steady state heat transfer Analysis of plane and Axisymmetric components.
9. Convective heat transfer – Internal flow (study both velocity and thermal boundary layers)
10. Convective heat transfer – External flow (study both velocity and thermal boundary layers)
11. Radiation heat transfer– Emissivity