III B. Tech – I Semester

(20ME5108) DESIGN AND ANALYSIS LAB

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
15	35	50	-	-	3	1.5

Pre-Requisites: Basic computer knowledge, Geometry

Course Objectives:

The Students will acquire the knowledge:

- To impart the fundamental knowledge on using various analytical tools like ANSYS, SIMULIA, ABAQUS, etc., for Engineering Simulation
- To know various fields of engineering where these tools can be effectively used to improve the output of a product.
- To impart knowledge on how these tools are used in Industries by solving some real time problems using these tools.

1. **Part modeling:**

Generation of various 3D models through protrusion, revolve, shell sweep. Creation of various features. Study of parent child relation. Feature based and Boolean based modeling surface and assembly modeling. Study of various standard translators. Design simple components.

2. **Drafting:**

Development of various components 3D models convert into 2D drawing in the form of orthographic and isometric representation & section views of dimensioning, bill of materials and tolerances scanning and plotting.

3. **Analysis:**

a) Determination of deflection and stresses in 2D and 3D trusses and beams.
b) Determination of deflections component and principal and Von-mises stresses in plane stress, plane strain and Axi-symmetric components.
c) Determination of stresses in 3D and shell structures (at least one example in each case)
d) Estimation of natural frequencies and mode shapes Harmonic response of 2D beam.
e) Steady state heat transfer Analysis of plane and Axi-symmetric components.

Packages to be provided to cater to drafting, modeling & analysis from the following: CATIA, Pro-E, I-DEAS, ANSYS, NISA, etc.

Course Outcomes:

After successful completion of the course, the students will be able to:

S. No	Course Outcome	BTL
1.	Understand the concepts of part drawings and assembly of various mechanical parts.	L4
2.	Understand the concepts of surface and assembly modeling	L4
3.	Solve displacements, stress and reactions in a the 2D bar, beam and truss elements.	L4
4.	Solve displacements, stress and reactions in a the 3D bar, beam and truss elements.	L4

Correlation of COs with POs& PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	1	2	1	1	1	1	1	1	1	2	3	2
CO2	2	1	1	1	1	1	1	1	1	1	1	2	3	1
CO3	2	2	1	2	1	1	1	1	1	1	1	2	3	1
CO4	2	1	1	1	1	1	1	1	1	1	1	2	3	2

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