

**IV B.TECH- I SEMESTER
SIMULATION LAB**

Course Code: ME7L1

Credits: 2

Lecture: ---

Internal assessment: 25 Marks

Lab practice: 3 Period/week

Semester end examination: 50 Marks

COURSE OBJECTIVES:

- Simulation lab course provides the undergraduates to perform the computational analysis and scientific computing in structural mechanics and heat transfer areas using FEA software.

COURSE OUTCOMES:

Upon the completion of this course the student will be able to:

1. Demonstrate the main stages of Finite Element analysis
2. Perform modeling and analysis of structural and heat transfer problems.

Any 12 of the following

1. Static analysis of indeterminate/ composite bars
2. Shear force and bending moment diagrams of a beam
3. Maximum deflection in a fixed/continuous beam with combination of loads
4. Thermal stress in bar
5. static analysis of plane or 3-space truss/frame
6. Evaluation of Stress concentration factor in a rectangular plate with central hole
7. Stress distribution in thick cylinders subjected to internal and/external pressures
8. steady state heat transfer in cylinder
9. Transient heat transfer in a sphere
10. A calculation of buckling load of a column
11. Natural frequency of a spring mass system
12. Natural frequencies of a continuous system
13. Harmonic analysis of a bar/beam
14. Velocity and acceleration analysis of a slider crank mechanism
15. Dynamic force analysis of a slider crank mechanism
16. Study of h-type and p-type convergence

Note:

1. The above tasks are to be performed Using FEA Software ANSYS

Reference Books:

1. Finite Element Analysis Using ANSYS by P. Srinivas, Krishna Chaitanya S., Rajesh Kumar D., PHI Learning Pvt. Ltd.2012.
2. Ansys Reference Manuals

