4/4 B.Tech. SEVENTH SEMESTER

ME7L1 **SIMULATION LAB** **Credits: 2**

Lecture:- **Internal assessment: 25marks**
Lab Practice: 3 periods/week **Semester end examination: 50 marks**

Objectives:

Simulation lab course provides the undergraduates to perform the computational analysis and scientific computing in structural mechanics and heat transfer areas using professional software's ANSYS and ALGOR

Learning outcomes:

At the end of course the students will be able to:

1. Identify and describe the main techniques utilised for computational analysis and the key stages associated with a basic Finite Element analysis
2. Select and plan suitable modeling and analysis strategies for a typical Finite Element Analysis.

Prerequisites:

Finite element method

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-dimensional 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 cylinders
9. Transient heat transfer in spheres
10. 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 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.

Reference Material

1. ANSYS 14.0 Theory and reference Manuals