COMPUTER AIDED DESIGN AND OPTIMIZATION LAB

Subject Code: 13ME2111 **L P C**
Prerequisites: CAD and Optimization methods **0 3 2**

Course Educational Objectives:

To impart knowledge to the student to

1. learn part modeling and their assemblies, drafting and animation of the mechanical components using modelling packages
2. understand static and transient thermal analysis using FEA packages
3. carry out single and multi objective optimization problems using MATLAB

Course Outcomes:

The student will be able to

1. create part model and assembly model of various components using modelling packages
2. perform static and transient thermal analysis using FEA packages
3. solve optimization problems using MATLAB

Note: Any **ten** exercises from the following

Introduction to various commands in solid modeling software

1. Part modeling of various components
2. Part modeling of fasteners like nut, bolt, screw, rivet etc.
3. Part modeling of I. C. engine parts
4. Drafting of I. C. engine parts
5. Assembly of screw jack
6. Animation of four bar mechanism

Introduction to various commands in analysis software

7. Static analysis of a corner bracket
8. Static analysis of truss
9. Analysis of cylindrical shell under pressure
10. Transient thermal stress in a cylinder

Introduction to various commands in MATLAB software

11. To carry out unconstrained non-linear single variable optimization
12. To carry out unconstrained non-linear multivariable optimization
13. To carryout multi-objective optimization
14. Exercise on use of Genetic algorithm toolbox

Modelling packages: CATIA, UNIGRAPHICS, Pro-E

Analysis packages: ANSYS, NISA

Optimization: MATLAB