COMPUTER AIDED DESIGN AND OPTIMIZATION LAB

Subject Code: 13ME2111   **L   P   C**
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Pre requisites: CAD and Optimization methods

Course Educational Objectives:

To impart knowledge to the student to

1. learn part modelling 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 modelling software

1. Part modelling of various components
2. Part modelling of fasteners like nut, bolt, screw, rivet etc.
3. Part modelling 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