SIMULATION LAB

Course Code: 13ME2317

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Pre requisites: Theory courses in Heat Transfer and Numerical Methods

Course Educational Objectives:

To make the student understand

1. solution of problems of heat conduction using fem software
2. solving problems involving heat transfer from fins by writing program codes in MAT lab software
3. solving problems containing flow and heat transfer using FVM software

Course Outcomes:

The student will be able to

1. write program source codes to some heat transfer problems and solve them using MAT lab
2. solve some heat transfer problems using FEM software
3. solve certain problems involving flow and heat transfer using FVM software

LIST OF NUMERICAL PROBLEMS:

Any TEN numerical problems.

The following problems are solved using MATLAB, FEM and FVM softwares.

1. Two dimensional steady state heat conduction in a slab.
2. One dimensional unsteady state heat conduction in a slab.
3. Heat transfer from a rectangular fin.
4. Heat transfer from a triangular fin.
5. Laminar flow through a rectangular duct.
6. Laminar natural convection from a vertical plate.
7. Parallel flow double pipe heat exchanger.
8. Counter flow heat exchanger.
9. Solution of a Tridiagonal matrix (TDM) using Thomas algorithm.
10. Solution of a second order ordinary differential equation by fourth-order Runge-Kutta Method.
11. Solution of simultaneous first order ordinary differential equations by fourth-order Runge-Kutta Method.