Course Code	Course Name	Credits
MTL404	**Technical Computing Laboratory**	**01**

Objectives

1. Understand and apply tools available for technical computing
2. Understand data manipulation and visualization
3. Programming for engineering applications

Outcomes: Learner will be able to…

2. Import , manipulate and graphically represent data.
3. Perform basic engineering calculations using automated tools.
4. Apply programming for modelling engineering systems.
5. Manipulate and visualize complex data.

Suggested List of laboratory experiments:

1	Importing data , sorting, filtering, formula, logical functions, statistical functions charts, graph plotting , curve fitting, using Microsoft Office Excel (or similar sheet based application)
2	Create an excel sheet for automatically solving heat transfer/strength of material problem using formula.
3	MATLAB® /Scilab data import , matrix manipulation and visualization, plotting , Surface Plots , histogram etc.
4	MATLAB® /Scilab programming , branching , loops and functions related exercise
5	Flat plate Cam profile modelling (Angle as input follower displacement as output) using MATLAB® /Scilab
6	Simulink /xcosintroduction ,commonly used blocks, Transfer function, Modelling and simulation of dynamic system such as Mechanical accelerometer.
7	Electrical system modelling using MATLAB® or Scilab (RLC Ckt / DC Motor etc)
8	Hydraulic / Thermal system modelling using MATLAB® /Scilab
9	3D Data Visualization (Slicing, Histogram etc) using ParaView or other visualization application
10	3D Data Visualization (Volume, Volume and Surface Combination etc) using ParaView or other visualization application

Term Work:

Term work consists of performing minimum 08 experiments from the list mentioned above. Final certification and acceptance of the term work ensures satisfactory performance of laboratory work. The distribution of marks for term work shall be as follows:

- Laboratorywork (Experiment/journal) : 20marks.
- Attendance (Practical) : 05Marks

References

1) Experiments with MATLAB Cleve Moler October 4, 2011 Mathworks
2) Introduction to Simulink® with Engineering Applications Second Edition Steven T. Karris Orchard Publications
3) The ParaView Tutorial Version 5.6 Kenneth Moreland Sandia National Laboratories