M.TECH SECOND SEMESTER
POWER SYSTEM SIMULATION LAB

17EEPC2L1 **Credits: 2**

Lab Practice: 3 periods/week **Internal Assessment: 25 marks**

End Semester Assessment: 50 marks

Course Objective:

The objective of this lab is to understand and use various software tools in electrical engineering for modeling and simulation of power systems operation and control.

Course Learning Outcomes: At the end of the course the student will be able to

1. Stability analysis for power system studies
2. Apply computational methods for power system studies and converter designs.
3. Identify and use modern tools like fuzzy logic and artificial neural networks for power system problems.
4. Asses the different state estimation techniques.
5. Evaluate the economic dispatch of coordinated thermal unit.

List of Experiments

Conduct any ten experiments

1. Simulation of Single Area and Two Area Systems using MATLAB/SIMULINK
2. Study of load frequency control problem of (i) uncontrolled and (ii) controlled cases using MATLAB/SIMULINK
3. Simulation of long line and reactive power control using PSCAD
4. Economic Dispatch of Thermal Plants using Conventional method using MATLAB
5. MVAR Compensation studies on normal and heavily loaded power systems using MATLAB
6. Contingency evaluation and analysis of power system using MATLAB
7. Development of single line diagram of power system components using PSCAD
8. Load Flow analysis using Mi Power
9. State Estimations using Neural Network using MATLAB
10. Contingency Analysis using Neural Network using MATLAB
11. Power system Security using Neural Network using MATLAB
12. Fuzzy Logic based Automatic Generation Control using MATLAB
13. Fuzzy Logic based small signal stability analysis using MATLAB
14. Economic Dispatch of Thermal Plants using ANN algorithm by MATLAB
15. Economic Dispatch of Thermal Plants using GA by MATLAB
16. Characteristics of DC-DC buck and boost converter using PSIM
17. Performance of single phase H-bridge five level inverter using PWM technique by PSIM
18. Transient stability analysis using Mi-Power
19. Harmonic analysis using Mi-Power
20. Small signal stability enhancement using Power System Stabilizer by PSCAD.