

M.TECH-INDUSTRIAL POWER AND AUTOMATION
EE-6491: INDUSTRIAL POWER & AUTOMATION LABORATORY
(Credits: 2)

List of Compulsory Experiments:

1. SCADA Experiments
 - a) SCADA- Transmission Module RTU in Local and Remote Mode.
 - a. Ferranti Effect
 - b. VAR Compensation (Series and Shunt)
 - c. Transmission Line Modelling
 - b) SCADA- Distribution Module RTU in Local and Remote Mode.
 - a. Load Shedding
 - b. Transformer Loading
 - c. Study of Communication Link
2. PLC Programming Experiments
 - a) Water Level Control
 - b) Control of Batch Process Reactor
 - c) Lift Control
 - d) Speed Control of AC Servo Motor
 - e) Automatic Star Delta Starter of Three Phase Induction Motor
3. AC Servo Motor Control using dSPACE
4. Energy Management in Centrifugal pumps by Variable Frequency Drive.
5. DSP Programming Experiments
 - a. Speed control of BLDC motor (2812/2407 kit).
 - b. Speed control of Induction motor (2812/2407 kit).
 - c. Speed control of DC motor (2812/2407 kit).
6. Stepper Motor speed control and step angle control using 8051 Microcontroller.
7. Measuring Force and thrust of a Linear Induction Motor.
8. Measurement of breaking Torque for Eddy Current Control drive.
9. Simulation of Pick and Place Robot in robot studio software and implementation in ABB IRB 1200

10. Vector control drive for 3 phase Induction motor using FPGA.
11. 1 HP Switched Reluctance Motor with Eddy Current loading arrangement.
12. Level Control of tank using Cascade Controller.
13. Level Control of tank using Split Range Controller.
14. Feed forward Control for various disturbances in the temperature process control.
15. Distributed Control Systems application and logic operations with master and slave controllers.
16. Conveyor Sorting System with color sensing fiber unit by using PLC and DCS.
17. Stamping Process by using Programmable Logic Controller and DCS.
18. MIMO system for multiple level, flow and temperature controls.
19. STATCOM and FACTS based Experiments.
 - a. Reactive Power Compensation using solar and wind based STATCOM.
 - b. Power Factor Compensation and Voltage Regulation using three phase FACTS controller.
20. Experiments on LabVIEW and MATLAB.
 - a. State Space Modeling of DC motor in MATLAB and LabVIEW.
 - b. PID, fuzzy and fuzzy-PID controller based speed control of dc motor in MATLAB.
 - c. PID Controller based speed control of DC motor in LabVIEW.

List of Desirable Experiments:

1. Testing of Numerical Overload Relay
2. Study of Common Industrial Communication Protocols
3. Effect of voltage control on a three phase Induction motor.
4. Speed control of three phase Induction motor by variable frequency method.
5. Process Interaction Observation in MIMO system
6. Level Control in Two tank Interacting Systems.
7. Cascade Control of Temperature Process tank.
8. Measuring Voltage and Current of the Microgrid using NI-myDAQ.
9. Solar, Wind based Load Voltage Regulation using cRIO.
10. Modeling and Simulation of FACT devices.