1. OBJECTIVES OF THE LABORATORY

- To synergies the combination of mechanical, electronics, control engineering and computer.
- Providing a focussed laboratory environment to the engineering students to apply and absorb Mechatronics concepts.
- To provide a common ground where students could perform experimental study regarding fundamental sequence control by utilising various sensors and actuators.
- The laboratory is designed to assist the students in the development of “hands-on” skills with an emphasis on hardware architecture and multidisciplinary systems.
- To introduce basic concepts in electrical measurements.
- To introduce the principles of signal conditioning and displaying.

2. MAJOR EQUIPMENTS

- Kits for experimentation
- Cathode Ray Oscilloscopes
- Function Generators
- Dual Channel Power Supplies
- Bread boards & other consumable items
- Ammeter
- Wattmeter
- Voltmeter
• Multimeter
• Electro-Pneumatic Trainer Kits
• PLC Trainer Kits

3. LIST OF EXPERIMENTS

A. For first year students- Students can perform set of experiments as given below:
   • Identification and familiarisation of the following components: resistors, inductors, capacitors, diodes, transistors, LED’s.
   • Familiarization with the following components: CRO, transformer, function generator, multimeter, power supply.
   • Familiarization with the following electrical machines: Induction motors, DC motors, synchronous motors, single phase motors.
   • Familiarization with the following mechanical components: gears, gear train, bearings, couplings, tachometer
   • To study and design the PN junction diode and its use as half wave and full wave rectifier.
   • To design a voltage regulator using zener diode. Discuss the behaviour of the regulator for various loads.
   • To verify truth tables of various logic gates and flip flops.
   • To study various sensors and transducers and compare with ideal characteristics.
   • To measure the characteristics of LVDT using linear displacement trainer kit.
   • To study the various components of electro pneumatic trainer kit and perform a set of experiments as follows:
     a) To study the flow control valve.
     b) Speed control of double acting cylinder.
     c) To study operation of single acting cylinder through single pilot operated 3/2 way valve.
     d) To develop OR logic by using pneumatic components.
     e) To develop AND logic by using pneumatic components.
     f) To study 5/2 way double solenoid direction control valve.
   • To familiarize with PLC working on PLC trainer kits.

B. For final year students- Students can perform experiments on PLC kits (PC WORKS and TWINCAT Software) as given below:
   • To switch ON any digital output from one input.
   • To ADD, SUBTRACT, DIVIDE, MULTIPLY two inputs.
   • To MOVE any value to other value.
   • To check greater value from two inputs.
   • To check lesser value from two inputs.
   • To check two inputs are equal.
   • To complement the input.
- To check the input1 is greater than or equal to input 2.
- To check the input1 is lesser than or equal to input 2.
- To switch ON any output till time it is not forced.
- To switch ON one output through two inputs.
- To run the motor through the soft starter.

4. **Name of Officials handling the Laboratory**:
   i. Official Incharge - Mrs. Puneet Arora (Assistant Professor)
   ii. Sr. Lab Technician - Sh.Dharampal (Sr. Lab Technician)
   iii. Lab Attendant - Mr.Rachhpal Singh (Computer Attendant)