COMPUTER AIDED MANUFACTURING AND AUTOMATION LABORATORY

Description of the Laboratory:

CAM & Automation Lab integrates design and manufacturing activities to promote the present industrial requirements. The lab allows the students to undergo a compressive study in the advances in Computer Aided Manufacturing technologies, Automation and Mechatronics. The lab focuses on the aspects of design and analysis, simulation, planning, product design, ergonomic design, product life cycle management. To achieve automated manufacturing, CAM uses technologies like FMS, AGV, Robotics, Mechatronics, Automated Conveyor Systems and Computer aided techniques unfortunately.

CAM & Automation Lab in the department consists of state of the art lab equipment and software which enhance the learning abilities and make student gear up for industrial needs.

List of Experiments

Any **TWELVE** experiments should be conducted and six experiments in each section.

Computer Aided Manufacturing (CAM):

1. Exercises in Basic manual part program and simulation practice in CNC TURN

   - Step turning.

   - Step turning and Taper turning, Profile turning.

2. Exercises in Manual part program using canned cycle and simulation practice in CNC TURN

   - Step turning using canned cycle.

   - Grooving using canned cycle.

   - Thread cutting using canned cycle.

   - Drilling using canned cycle.

3. Exercises in Basic manual part program and simulation practice in CNC MILL

   - Profile Milling.

   - Circular pocket milling.

   - Rectangular pocket milling.

4. Component making practice in CNC TURN

   - Step turning.

5. Component making practice in CNC TURN

   - Step turning and Taper turning, Profile turning.

6. Component making practice in CNC TURN

   - Thread cutting using canned cycle.

7. Component making practice in CNC Mill

   - Profile Milling.

8. Component making practice in CNC Mill

   - Rectangular pocket milling

9. Die Making practice using CNC Mill

Automation:

1. Design and testing of hydraulic circuits for single acting cylinder using pressure control Valves, flow control valves, DCVs (Mechanical, Pilot, Solenoid)

2. Design and testing of hydraulic circuits for double acting cylinder using pressure control Valves, flow control valves, DCVs (Mechanical, Pilot, Solenoid)

3. Design and testing of hydraulic circuits for single/double acting cylinder using Gate valves Pressure control valves, flow control valves, DCVs(Mechanical, Pilot, Solenoid)

4. Design of circuit with programmed logic sequence, using PLC in hydraulic Electro hydraulic Trainer

5. Programming of PLC using ladder logic diagram

6. Circuits with multiple cylinder sequences in Electro pneumatic Trainer using PLC

7. Simulation of basic hydraulic, pneumatic and electrical circuits using Automation studio Soft ware.

8. Modeling and analysis of basic electrical, hydraulic, and pneumatic systems using MATLAB/LABVIEW software

9. Programming exercise for robot

List of Software:

   - SIEMENS SinuMeric SinuTrain 840D
   - CNC Train Offline Simulation
   - Mastercam 2016

Photographs of the Lab/Equipment: