

# **Centre of Excellence on Industrial Automation Technologies**

## **COER University, Roorkee**

It is a capacity center for multidisciplinary and cross-functional integration to nurture the latest technological innovation with defined process management and experts with an arrangement of best tools and practices at its most mature states. The Centre of Excellence (CoE) in Industrial Automation Technologies at COER University is a state-of-the-art training and applications hub that empowers students, faculty and industry professionals with practical, hands-on expertise in cutting-edge automation systems and Industry 4.0 innovations.

### **Vision:**

To be a nationally recognized hub for applied industrial automation and Industry 4.0 training, bridging the gap between academic learning and real-world industrial requirements.

### **Outcomes & Offerings:**

- Industry-relevant skilling programs for students and professionals.
- Faculty development, hands-on labs and real-time project exposure.
- Capstone projects, internships and research in Industry 4.0 technologies.

### **COER Domains and Facilities:**

#### **1. Industrial Hydraulic Technology & Application**

##### **Available Technical Infra and facilities**

- Hydraulic valves, actuators, pumps for industrial automation
- Automation circuits-manual control, electro hydraulic, fully automatic hydraulic systems
- Automation circuits simulation on Auto SIM
- Application demonstration and fault diagnosis- hydraulic crane, pump test rig, water hydraulic
- Fixed hydraulic
- PID controller
- Valve test rig
- Integration with AB 820 for fully automation using Rslogix500

## **2. Industrial Pneumatic Technology & Application**

### **Available Technical Infra and facilities**

- Pneumatic valves, actuators, compressors, FRL for industrial automation from fest, genetics
- Automation circuits-manual control, electro Pneumatic, fully automatic pneumatic system
- Operating principles of air as medium and its properties
- Automation circuits simulation on Auto SIM
- Application demonstration sorting system-color, type and orientation, Marine engine control system
- Fixed Pneumatic system
- Integration with AB 820 for fully automation

## **3. PLC Training & Application**

### **Available Technical Infra and facilities**

- Hardware components for industrial automation( PLCs, Sensors, Motors, Software, application work bench, Relay cards, SMPS, switches, MCDS, Contactors)
- Automation circuits
- Operating principles of PLCs and PLC architecture
- Ladder diagram (LAD) programming
- Specialty programming blocks
- Human-machine interfaces (HMIs)- Preface
- Application Demonstration – Batch Processing, Servo Motor, DC Motor
- Controllers- AB1000, AB820, Siemens 1200
- Programming- CCW, Rslogix500, TIA

## **4. Industry 4.0 – Cyber Physical System Training & Application**

### **Development**

### **Available Technical Infra and facilities**

- Conveyor system
- Pneumatic pinning system
- Pneumatic press system
- Linear Module
- Drilling system
- Material handling system

- Welding simulator
- Storage system
- Operating principles of PLC AB 820, AB850 and integration, Networking , handshaking principle
- Control wiring
- Power wiring
- Ladder diagram (LAD) programming
- SCADA Interface wireless –factory automation

## **5. Sensoric Technology & Applications**

### **Training systems for industrial Sensors**

- Inductive type
- Capacitive type
- Photo Reflective Type
- Photo Interrupt type
- Magnetic type
- Ultrasonic
- Encoder
- DC motor integration
- Solenoid
- Touch ,Float, limit Switches , gas sensor

## **6. Refrigeration & Air Conditioning Technology & Application**

### **Applications Demonstration through**

- Heat Exchanger Trainer-Water as medium
- Heat Exchanger Trainer-Water and Air as medium
- Air Conditioning tutor with Electronic Expansion Valve
- Experimental Vapor Absorption Refrigeration
- Transparent Evaporation Refrigerator
- Automatic Air Conditioning Trainer
- Refrigeration Trainer for Fault Tutor with VFD
- ICE Plant Tutor
- Water Based Heat Pump

## Glimpse of Facilities and Trainings

### 1. Entrance:



### 2. Training Centre:



### 3. Industry 4.0 Ready FMS:







#### 4. Training Sessions:



