

Electrical Automation Lab

Overview:

This lab is designed to provide students with **hands-on training in industrial automation, electrical control systems, and smart grid technologies.**

It integrates **Siemens automation solutions**, enabling students to work on **Programmable Logic Controllers (PLC)**, **Supervisory Control and Data Acquisition (SCADA)**, **Variable Frequency Drives (VFD)**, and **industrial communication networks**. The lab helps students gain **practical experience in automation, power management, and control systems**, preparing them for industries such as **manufacturing, power generation, process automation, and smart infrastructure.**



Key Features:

1. **Industrial PLC & SCADA Systems**
 - Hands-on training with Siemens PLCs (S7 series) and TIA Portal software.
 - SCADA-based process automation for remote monitoring and control.
2. **Variable Frequency Drives (VFD) & Motor Control**
 - Training on motor speed control using Siemens VFDs.
 - Implementation of energy-efficient motor operation techniques.
3. **Electrical Power Distribution & Smart Grid Technologies**
 - Simulation of electrical networks for load management and fault detection.
 - Training in smart metering and power system automation.
4. **Industrial Sensors & Actuators**
 - Proximity, temperature, pressure, and flow sensors for automation applications.
 - Real-time data acquisition and analysis for predictive maintenance.
5. **Industrial Communication & IoT Integration**
 - PROFIBUS and PROFINET networking for industrial automation.
 - IoT-enabled monitoring and cloud-based analytics for smart factories.
6. **Hands-on Training & Industry Certifications**
 - Siemens-certified courses in industrial automation, power control, and SCADA systems.
 - Real-world projects in manufacturing, power distribution, and smart infrastructure.

Expected Outcomes:

- **Industry-Ready Professionals** – Skilled in PLC programming, SCADA operations, and industrial automation.
- **Improved Industrial Efficiency** – Optimized power management and automation processes.
- **Smart & Sustainable Energy Solutions** – Training in smart grid and energy-saving technologies.
- **Bridging the Skill Gap** – Preparing students for careers in electrical automation and process control.