

**DEPARTMENT OF ELECTRONICS AND INSTRUMENTATION  
ENGINEERING**

**EEIEVAC01- Industrial Automation**

**Unit I Introduction to Automation**

Automation overview – requirement of automation systems – architecture of industrial automation system – Levels of Automation-basic elements of an automated system – industrial bus systems :modbus and profibus.

**Unit II Automation Components**

Sensors for temperature, pressure, flow and level measurements.

Smart sensor: -Definition –classification- General architecture – Block level design consideration - Importance and adoption of smart

sensor-Types of smart sensors-compensation. Actuators – process control valves – power electronic drives DIAC- TRIAC – power MOSFET – IGBT. Introduction to DC and AC servo drives for control-Smart actuators.

**Unit III Programmable Logic Controllers**

PLC Hardware – PLC programming – ladder diagram – sequential flow chart – PLC communication and networking – PLC selection – PLC installation – Advantages – Application of PLC to process control industries.

**Unit IV Distributed Control System (DCS) and SCADA**

Overview of DCS – DCS hardware – DCS software configuration – DCS communication – DCS supervisory computer tasks – DCS integration with PLC and Computers-Features and Advantages.

Introduction to Supervisory Control and Data Acquisition Systems (SCADA) – SCADA HMI Essentials – SCADA Components – SCADA Configuration and Software – HMI hardware and software

**Unit V Hands on Training**

Simple experiments on sensors, Actuators, PLCs, DCS and SCADA.

**Text Books:**

Industrial Instrumentation, Control and Automation,S.

Mukhopadhyay,S.Sen and A.K. Deb, Jaico Publishing House, 2013.

Principles of Industrial Instrumentation, Patranabis, McGraw Hill, **2010**

**References:**

Electric Motor Drives, Modelling,Analysis and Control, R.Krishnan,Prentice Hall India, 2002

Industrial Electronics and Control Including Programmable Logic Controller, BiswanathPaul , PHI,2014.

Krishna Kant, “Computer Based Industrial Control” Second edition, Prentice Hall of India, New Delhi,2010

Lukcas, Distributed Control Systems, Van Nostrand Reinhold Co., 1986.

Programmable Logic Controllers: Principles and Applications, John W Webb, Pearson, 2015.