

IV Year II Semester

L T P C

Code: 17EE842

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INDUSTRIAL AUTOMATION & CONTROL

UNIT-1 Introduction: Automation overview, Requirement of automation systems, Architecture of Industrial Automation system, Introduction of PLC and supervisory control and data acquisition (SCADA). Industrial bus systems: modbus & profibus. Role of computers in measurement and control.

UNIT-2 Automation Components: Sensors for temperature, pressure, force, displacement, speed, flow, level, humidity and pH measurement. Actuators, process control valves, power electronics devices DIAC, TRIAC, power MOSFET and IGBT. Introduction of DC and AC servo drives for motion control.

UNIT-3 Automation in Process Industries: Introduction to computer based industrial automation. Programmable Logic Controller (PLC)- Block diagram of PLC, Programming languages of PLC, Basic instruction sets, Design of alarm and interlocks, Networking of PLC, Overview of safety of PLC with case studies. PLC programming, Ladder diagram, Sequential flow chart, PLC Communication and networking, PLC selection, PLC Installation, Advantage of using PLC for Industrial automation, Application of PLC to process control industries, Process Safety Automation, Levels of process safety through use of PLCs, Application of international standards in process safety control.

UNIT-4 Distributed Control System: Overview of DCS, DCS software configuration, DCS communication, DCS Supervisory Computer Tasks, DCS integration with PLC and Computers, Features of DCS, Advantages of DCS. Introduction to communication protocols - Profibus, Field bus, HART protocols, etc.

UNIT-5 Process Control: Sequence control, Control of Machine Tools , Hydraulic & Pneumatic Control Systems, Motor Drives, Introduction, Characteristics, Adjustable Speed Drives, Basic construction and configuration of robot, Pick and place robot, Welding robot, Spray robot etc.