Department of Electrical and Electronics

New course introduced

SL. NO.	COURSE CODE	COURSE OFFERED
1	SEE1614	INDUSTRIAL INSTRUMENTATION AND AUTOMATION

SEE1614	INDUSTRIAL INSTRUMENTATION AND AUTOMATION	L	T	P	Credits	Total Marks
		3	0	0	3	100

COURSE OBJECTIVES

To study the various Components in the Industrial Automation.
To have an adequate knowledge about different industrial instrumentation
To get the Knowledge in PLC for various Applications
To Study the various components in SCADA.

UNIT 1 INTRODUCTION **9 Hrs.**

Need and benefits of Industrial Automation, Automation Hierarchy, Basic components of automation system, description of each component, Types of automation system: - Fixed, programmable, flexible.

UNIT 2 SENSORS AND TRANSDUCER **9 Hrs.**

Piezoelectric, Photovoltaic, Hall Effect, Magneto strictive, Radio-Active Absorption, Ionic Conduction Transducers, Digital Transducers - Digital Displacement Transducer, Shaft Angle Encoder, Optical Encoders, Magnetic Encoders -Digital Speed Transducers -Variable Reluctance Type, Smart Sensors - SQUID Sensors - Film Sensors – MEMS - Basic Concept of MEMS

UNIT 3 INTRODUCTION TO PLC **9 Hrs.**

Introduction to Sequence Control, PLCs - Working, Specifications of PLC Onboard/Inline/Remote IO's, Comparison of PLC & PC, Relay Ladder Logic- PLC Programming- realization of AND, OR logic, concept of latching.

UNIT 4 PLC AND ITS APPLICATIONS **9 Hrs.**

Introduction to Timer/Counters, ON Delay Timer, OFF Delay Timer - Exercises based on Timers, Counters - Up Counters, Down Counters. Logical Instructions, Comparison Instruction, Arithmetic Instructions, Data Handling Instructions. PLC based applications: Motor sequence control, Traffic light control, elevator control, Tank level control, conveyor system, Stepper motor control.

UNIT 5 SCADA **9 Hrs.**

Introduction to SCADA, typical SCADA block diagram, - Common System Components Supervision and Control- HMI, RTU and Supervisory Stations- Trends in SCADA, benefits of SCADA. Interfacing SCADA system with PLC: Typical connection diagram, Object linking and embedding for Process Control (OPC) architecture.

Max. 45 Hrs.

COURSE OUTCOMES

On completion of the course, student will be able to

CO1 - Identify Different components of an Automation System.
CO2 - Analyze the New sensors and Transducer for the applications
CO3 - Interface the given I/O Device with appropriate PLC Module.
CO4 - Prepare a PLC Ladder Program for the given applications.
CO5 - Prepare a simple SCADA Applications.
CO6 - Design the Interfacing SCADA system with PLC

TEXT / REFERENCE BOOKS

1. Stenerson, Jon," Industrial Automation and Process Control", PHI Learning, New Delhi, ISBN 9780130618900.
2. D. Patra Nabis, 'Sensors and Transducers', Prentice Hall of India, 1999.
3. Dr. S. Renganathan, "Transducer Engineering" -Allied Publishers Limited.
4. .Jadhav, V. R.," Programmable Logic Controller", Khanna publishers, New Delhi, 2017, ISBN : 9788174092281
5. Petruzella,F.D," Programmable Logic Controller", Tata — McGraw Hill India, New Delhi, Fourth edition,20l0, ISBN: 9780071067386.
6. Mitra, Madhu Chandra, Sengupta, Samarjit," Programmable Logic Controllers and Industrial Automation an Introduction", Penram International Publication, New Delhi 2015,Fifth Reprint, ISBN 9788187972174.
7. Boyar.S.A," Supervisory Control and Data Acquisition", ISA Publication, New Delhi , Fourth Edition, ISBN 978-1936007097.

END SEMESTER EXAMINATION QUESTION PAPER PATTERN

Max. Marks:100 **Exam Duration:3 Hrs.**

PART A: 10 Question of 2 marks each – No choice **20 Marks**
PART B: 2 Questions from each unit of internal choice; each carrying 16 marks **80 Marks**