Nirma University
School of Technology, Institute of Technology
B. Tech (Instrumentation and Control Engineering)

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2	0	2	3

Course Code	**2ICDE60**
Course Title	**Factory Automation**

Course Learning Outcome:
At the end of the course, students will be able to -

- recognize the fundamental principles of programmable logic controller
- program PLC using standard programming techniques
- develop an application-oriented project using PLC.

Syllabus **Teaching Hours**

UNIT 1: Introduction **03**

Introduction, Evolution History, Importance of PLC, Type of PLC's and basic architecture.

UNIT 2: Internal Architecture and Interfacing Module **03**

CPU, Memory Organization, Power Supply, Input/ Output Interface, Analog and digital input-output modules.

UNIT 3: Basic Operation and programming **06**

PLC operation, Ladder logic, Logic functions, Basic relay instructions, Timer/Counter Instructions.

UNIT 4: PLC Programming instructions **06**

Comparison, Arithmetic, Logical, Data handling, input-output instructions.

UNIT 5 : PLC Project Development **06**

PLC specification and selection criteria, Sensor/Actuator selection, wiring connection with sourcing and sinking module, Wiring diagram, Concept of

Redundancy and Safety.

UNIT 6: Introduction to Industrial Networking **06**

Interface Standard, Modbus and Modbus plus Protocols, CC-Link overview, Industrial Ethernet overview, TCP/IP overview.

Self-Study:

The self study contents will be declared at the commencement of semester. Around 10% of the questions will be asked from self study contents.

Laboratory Work:
Laboratory work will consist of minimum 10 experiments based on the above syllabus.

References:

1. Frank Petruzzula, Programmable Logic Controllers, Tata Mc-Graw Hill Edition
2. John W. Webb, Ronald A. Reis, Programmable Logic Controllers Principles and Applications, PHI publication
3. Madhuchannd Mitra and Samerjit Sengupta, Programmable Logic Controllers Industrial Automation an Introduction, Penram International Publishing Pvt. Ltd.
4. J. R. Hackworth and F. D. Hackworth, Programmable Logic Controllers Principles and Applications, Pearson publication.