Industrial Automation

Code	Course Title	(Credit)	T-P-PJ
IACU2100	Industrial Automation	24	5-9-10

Course Code	Course Title	Credits	Type T-P-PJ
CUIA2100	Introduction to Industrial Automation	1	1-0-0
CUIA2101	Advanced Programming & Control Blocks of PLC	3	1-2-0
CUIA2102	Control & Signal Wiring of PLC	2	0-2-0
CUIA2103	SCADA based advanced features	2	1-1-0
CUIA2104	SCADA & PLC based sequential control	1	0-1-0
CUIA2105	Human Machine Interface	3	1-2-0
CUIA2106	OPC server base data fetching & control	2	1-1-0
CUIA2107	Project	6	0-0-6
CUIA2108	Internship	4	0-0-4
	Total Credits	**24**	

Domain Track Objectives

- To upgrade knowledge levels needed for modern industries.
- Process & sequential control logic of industry.
- Project based training.

Domain Track Course outcomes

- Gain knowledge on advanced industrial automation.
- Understand different types of Devices to which PLC input and output modules are connected.
- Provide the knowledge about understand various types of mobile applications.
- Industry based project & advanced learning.
- Students will develop skill of designing automatic control system and controller for a particular application.

Domain Syllabus

Course – 1: INTRODUCTION TO INDUSTRIAL AUTOMATION

1.1   Automation Uses

1.2   Automation - PLC Basics

1.3   Mechanical relays versus PLC

1.4   Functions of various blocks and working principle of advanced blocks.

Course – 2: ADVANCED PROGRAMMING & CONTROL BLOCKS OF PLC

2.1   CPT, ADD, SUB, MUL, DIV, SQR, NEG, TOD, FRD

2.2   MOV, MVM, AND, OR, XOR, NOT. CLR.

2.3   BSL, BSR, SQC, SQL, SQO, FFL, FFU, LFL, LFU

2.4   JMP, LBL, JSR, MCR

2.5   Connecting PLC software with SCADA software

Practice:

P2.1 - Comparison of industry based analog signals.

P2,2 - Detecting different product output of an industry

P2.3 - Sequential control of an industry by using advanced blocks.

P2.4 - Emergency control system of an industry

P2.5 - Connecting PLC software with SCADA software

Course – 3: CONTROL & SIGNAL WIRING OF PLC

3.1   Control wiring of PLC.

3.2   PLC, Sensor and field instruments signal flow wiring.

3.3   Device connectivity

Practice:

P3.1 PLC input/output wiring concept.

P3.2 Connecting relay, contactor, sensors and other field instruments.

P3.3 Controlling an industry motor using STAR-DELTA connection

Course – 4: SCADA BASED ADVANCED FEATURES

4.1   Alarms

4.2   Trends, Data base connectivity & Report generation

4.3   Recipe management

4.4   Security

Practice:

P4.1 - Data fetching and representing on graph and excel

P4.2 - Advanced controlling of industry by using SCADA

Course – 5: SCADA & PLC BASED SEQUENTIAL CONTROL

5.1   Script

5.2   Networking

5.3   Device connectivity.

Practice:

P5.1   Script

P5.2   Networking

P5.3   Device connectivity

Course – 6: HUMAN MACHINE INTERFACE

6.1   What is HMI. Use of HMI

6.2   Concept of different operational features

6.3   Connectivity of HMI and PLC.

Practice:

P6.1   Alarms

P6.2   Security

P6.3   Recipe manager

Course – 7: OPC SERVER BASE DATA FETCHING & CONTROL

7.1   Study of Open Platform Communications

7.2   OPC to control PLC, SCADA.

7.3   OPC based different protocol concept.

7.4   Data handling using OPC.

Practice:

P7.1   Installation of OPC

P7.2   OPC protocols

P7.3   Connectivity of PLC, SCADA & ARDUINO to OPC.