I	SECTION CODE	**IA**
II	SECTION NAME	**INDUSTRIAL AUTOMATION**
III	COURSE CODE	**IA-01**
IV	COURSE TITLE	**PLC PROGRAMMING FOR INDUSTRIAL AUTOMATION**
V	DURATION	**01 Week**
IV	**OBJECTIVES**	
On completion of the course, the learner will be able to explain the applications of PLC in automation and be able to demonstrate the practical competencies as stated in the contents below		

VI **Course Content:**

Theory topics	Practical Topics
Introduction to the PLC, its advantages and applications in industrial automation. Introduction to Siemens S7 PLC hardware. Introduction to commonly used transducers, sensors and output devices and components in automation. Introduction to Ladder logic instructions and programming using various types of instructions. Handling Analog Input and output in PLC.	Using Simatic manger, configuring hardware, establishing communication, uploading and downloading programs. Writing programs to test bit logic, data transfer, arithmetic, comparison, timer and counter instructions for digital logic. Using PLC for sensing light, proximity, size, presence, level etc. to control various outputs like relays, motors, valves, cylinders and lamps. Writing and testing PLC programs for applications like water level controller, bottling plant process control etc. Configuring the analog I/O and writing program for analog applications. Sensing and controlling analog input and output.

I	SECTION CODE	**IA**
II	SECTION NAME	**INDUSTRIAL AUTOMATION**
III	COURSE CODE	**IA-02**
IV	COURSE TITLE	**SCADA**
V	DURATION	**01 Week**
IV	**OBJECTIVES**	
On completion of the course, the learner will be able to explain the application of SCADA in automation and be able to demonstrate the practical competencies as stated in the contents below		

VI **Course Content:**

Theory topics	Practical Topics
Introduction to the concepts, history and elements of SCADA. Generations and architecture of SCADA systems. Tag management & creation of graphic displays, configuration of Alarms, Trends, and Message windows. Creation of message sequence report, Tag logging report.	Creating SCADA projects. Adding and configuring communication driver and tags. Creating graphic screens, adding objects on the screen, configuring the objects' properties and events. Testing the graphics runtime and displaying the process values. Configuring alarms, Outputting an alarm message sequence report, outputting and tag logging run time report.

I	SECTION CODE	**IA**
II	SECTION NAME	**INDUSTRIAL AUTOMATION**
III	COURSE CODE	**IA-03**
IV	COURSE TITLE	**PIC MICROCONTROLLER PROGRAMMING AND APPLICATIONS**
V	DURATION	**01 Week**
IV	**OBJECTIVES**	
On completion of the course, the learner will be able to describe the PIC microcontroller architecture and be able to demonstrate the practical competencies as stated in the contents below.		

VI **Course Content:**

Theory topics	Practical Topics
Introduction to Embedded systems and programming. PIC microcontroller architecture, Memory organization, port structure, Timers and counters. Introduction to embedded C for PIC microcontroller. Programming examples in embedded C language. Use of timers and counters, serial port programming. Programming and interfacing the PIC microcontroller with common input and output devices.	Identifying the various elements of the PIC microcontroller programming IDE. Writing and testing programs for 8051 micro controller in Embedded C. Using various data types and instructions. Programming for using ports as input and output ports, practice programming for data conversion, logic operation etc. Writing delay functions. Writing and testing programmes to use the timers and counters. Interfacing the microcontroller with stepper motor controller, elevator simulator, traffic light control circuits etc.

I	SECTION CODE	**IA**
II	SECTION NAME	**INDUSTRIAL AUTOMATION**
III	COURSE CODE	**IA-04**
IV	COURSE TITLE	**INTERNET OF THINGS WITH ARDUINO**
V	DURATION	**01 Week**
IV	**OBJECTIVES**	
On completion of the course, the learner will be able to describe Internet of Things and be able to demonstrate the practical competencies as stated in the contents below		

VI Course Content:

Theory topics	Practical Topics
Introduction to the concepts of "Internet of Things ", its advantages and present trends. Introduction to the role and importance of the internet and cloud in IOT. Introduction to Arduino - the board, IDE, Shields and Libraries. Using C for Arduino programming. Writing and testing programmes for Digital I/O, PWM and serial communication. Introduction to various sensors. Introduction to Bluetooth, GSM and Wi Fi shields for wireless communication and appliance control with Arduino.	Identification of the various components of the Arduino board. Identifying the various elements of the programming IDE. Creating simple Arduino sketches using data types, operators, control structures, loops and functions. Performing serial communication. Writing and testing sketches for controlling digital I/O, PWM, Interfacing LEDs and switches. Using sensors for temperature, light, proximity, motion indication etc. Controlling lamps, relays, motors etc. Using the Bluetooth and GSM modules for communication with devices.

I	SECTION CODE	**IA**
II	SECTION NAME	**INDUSTRIAL AUTOMATION**
III	COURSE CODE	**IA-05**
IV	COURSE TITLE	**DIGITAL LOGIC AND ELECTRONIC CONTROL**
V	DURATION	**01 Week**
IV	**OBJECTIVES**	
On completion of the course, the learner will be able to explain the concepts and applications of digital logic and electronic control and be able to demonstrate the practical competencies as stated in the contents below		

VI Course Content:

Theory topics	Practical Topics
Introduction to the concepts of electronic control and digital logic. Introduction to the working of electronic components like diodes, transistors and thyristors. Introduction to sensors like LDR and thermistor and optical proximity sensor. Introduction to electromagnetic relays, output devices like LEDs, DC motors, buzzers and optocouplers. Introduction to Digital systems, logic gates and basic control using logic gates.	Identifying and testing electronic components like diodes, transistors, LEDs, LDRs, thermistors etc. Using electronic components for switching and control. Identifying and testing relays, optocouplers and optical proximity sensors. Testing digital logic gates ICs. Controlling outputs like LEDs, relays and buzzers for situations involving various digital logics.