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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	
<p>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</p>		

VI Course Content:

Theory topics	Practical Topics
<p>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.</p>	<p>Using Simatic manager, 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.</p>

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I	SECTION CODE	IA
II	SECTION NAME	INDUSTRIAL AUTOMATION
III	COURSE CODE	IA-02
IV	COURSE TITLE	SCADA
V	DURATION	01 Week
IV	OBJECTIVES	
<p>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</p>		

VI Course Content:

Theory topics	Practical Topics
<p>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.</p>	<p>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.</p>

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I	SECTION CODE	IA
II	SECTION NAME	INDUSTRIAL AUTOMATION
III	COURSE CODE	IA-03
IV	COURSE TITLE	EMBEDDED APPLICATIONS DEVELOPMENT USING 8051
V	DURATION	01 Week
IV	OBJECTIVES	
<p>On completion of the course, the learner will be able to describe the applications of 8051 microcontroller and be able to demonstrate the practical competencies as stated in the contents below.</p>		

VI Course Content:

Theory topics	Practical Topics
<p>Introduction to Embedded systems and programming. 8051 microcontroller architecture, Memory organization, port structure, Timers and counters. Introduction to embedded C for 8051 microcontroller. Programming examples in embedded C language. Use of timers and counters, serial port programming. Programming and interfacing the 8051 microcontroller with common input and output devices. Introduction to designing applications using 8051.</p>	<p>Identifying the various elements of the 8051 microcontroller programming IDE.</p> <p>Writing and testing programs for 8051 micro controller in Embedded C. Using various data types and instructions. Programming for using ports, data conversion, logic operations etc.</p> <p>Writing code for delay functions, timers and counters.</p> <p>Coding and testing applications like keyboard display control, dc motor control, stepper motor control, traffic light control, elevator control, function generator, sensing light and temperature to control various outputs.</p>

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I	SECTION CODE	IA
II	SECTION NAME	INDUSTRIAL AUTOMATION
III	COURSE CODE	IA-04
IV	COURSE TITLE	IOT IMPLEMENTATION, PROTOCOLS AND SECURITY
V	DURATION	01 Week
IV	OBJECTIVES	
<p>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</p>		

VI Course Content:

Theory topics	Practical Topics
<p>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 GSM and Wi Fi shields for wireless communication and appliance control with Arduino. Introduction to IOT Protocols and Security.</p>	<p>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. Loading sensor data on to the internet. Using the Wi-Fi and Bluetooth modules for communication with devices.</p>

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I	SECTION CODE	IA
II	SECTION NAME	INDUSTRIAL AUTOMATION
III	COURSE CODE	IA-05
IV	COURSE TITLE	APPLICATIONS OF DIGITAL ELECTRONICS
V	DURATION	01 Week
IV	OBJECTIVES	
<p>On completion of the course, the learner will be able to explain the concepts, applications of digital logic and be able to demonstrate the practical competencies as stated in the contents below</p>		

VI Course Content:

Theory topics	Practical Topics
Introduction to Digital systems and logic gates. Introduction to Binary, Octal and BCD Number systems. Concepts of Combinational circuits. Operations. Introduction to Sequential Logic circuits. Concepts of Flip Flops, Shift Registers and Counter. Introduction to Seven Segment Displays.	Testing digital logic gates ICs. Constructing and testing Adders, Subtractors and Comparators. Constructing and testing Multiplexer and Demultiplexer. Testing Flip Flop circuits. Designing and Testing Counters and Shift Registers. Interfacing Seven Segment Displays.

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I	SECTION CODE	IA
II	SECTION NAME	INDUSTRIAL AUTOMATION
III	COURSE CODE	IA-06
IV	COURSE TITLE	CYBERSECURITY FUNDAMENTALS
V	DURATION	01 Week
IV	OBJECTIVES	
<p>On completion of the course, the learner will be able to describe the roles, objectives, principles and methods of Cybersecurity and be able to demonstrate the practical competencies as stated in the contents below</p>		

VI Course Content:

Theory topics	Practical Topics
<p>Introduction to Information security and Cybersecurity. Introduction to the best practices in Information Security.</p> <p>Introduction to the roles, objectives and principles of Cybersecurity. Introduction to Ethics in Cybersecurity, the I.T Act and penalties for cybercrimes.</p> <p>Description of risk management processes and practices. Identification of security tools and techniques. Introduction to system and application security threats, vulnerabilities and attacks.</p> <p>Introduction to Browser security. Introduction to Security auditing and incident reporting.</p>	<p>Videos on the role and objectives of cybersecurity.</p> <p>Lecture on Cybersecurity ethics, I.T act and cybercrimes by field expert.</p> <p>Lecture on risk management and practices by field expert.</p> <p>Lecture on security tools and techniques, application threats and vulnerabilities by field expert.</p> <p>Identifying the browser threats and mitigating the losses.</p>

 ATI Observe, Acquire, Empower	ADVANCED TRAINING INSTITUTE, HYDERABAD	PR04/F01
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I	SECTION CODE	IA
II	SECTION NAME	INDUSTRIAL AUTOMATION
III	COURSE CODE	IA-07
IV	COURSE TITLE	PROGRAMMING WITH PYTHON
V	DURATION	01 Week
IV	OBJECTIVES	
<p>On completion of the course, the learner will be able to build the logic, write programs in Python and be able to demonstrate the practical competencies as stated in the contents below</p>		

VI Course Content:

Theory topics	Practical Topics
<p>Introduction to Python programming language, its main features and advantages. Introduction to input and output in Python. Concepts of Control Structures and Loops in Python. Introduction to Functions, File operations and String operations in Python. Introduction to OOPS, Lists and Dictionaries in Python.</p>	<p>Writing and testing programs in Python using various data types. Performing Arithmetic, Logic and Relational operations. Using Control Structures and Loops in Python. Writing and testing programs for String manipulation and File operations in Python. Writing user defined functions. Creating and using objects in Python. Creating and manipulating Lists, Tuples and Dictionaries.</p>

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I	SECTION CODE	IA
II	SECTION NAME	INDUSTRIAL AUTOMATION
III	COURSE CODE	IA-08
IV	COURSE TITLE	REPAIR OF MOBILE PHONES
V	DURATION	01 Week
IV	OBJECTIVES	
<p>On completion of the course, the learner will be able to repair the mobile phones and be able to demonstrate the practical competencies as stated in the contents below</p>		

VI Course Content:

Theory topics	Practical Topics
<p>Introduction to basic electronics, electronics components and measurements. Soldering and desoldering. Concepts of mobile communication, cell phone technologies, block diagram and working of cell phones. Cell phone hardware components. Troubleshooting of cell phone problems. Cell phone network concepts and problems. Cell phone Operating System, Drivers and Applications. Formatting the phone and loading OS.</p>	<p>Identification and checking of basic electronic components. Using the multimeter for measurement of voltage, resistance and other components. Practice of Soldering, Desoldering and Hot Air Blowing.</p> <p>Dismantling the mobile phone. Identify the parts, test basic parts like speaker, MIC, Buzzer, Keypad, Camera etc. Removing the LCD and Touch Screen. Troubleshooting display issues. Battery checking, and charging. Cleaning the waterlogged phones. Systematic identification of problems and troubleshooting. Working with mobile phone settings for display, keypad etc. Formatting the mobile phone, loading OS, drivers and application software.</p>