

Foundation Course in Internet of Things (IoT)

Detailed Syllabus of Course

S. No	Module Title	Topics	Duration (Hours)		Learning Outcome
			Theory	Lab	
1.	IoT Introduction & Concepts	<ul style="list-style-type: none">• IoT Architecture• Physical & Logical IoT design Basics• IoT Enabling Technologies• IoT Stack• IoT Applications	4	1	<ul style="list-style-type: none">• Understand the Architecture of IoT• Building Blocks in development of IoT• IoT Applications

2	Sensors & Actuators	<ul style="list-style-type: none"> • Sensor working • Sensor Characteristics • Types of sensors and working principle • Sensors used in IoT 	2	1	<ul style="list-style-type: none"> • Understand the working principle of sensors and actuators • Sensors to be used for IoT applications
3	IoT Hardware platforms	<ul style="list-style-type: none"> • IoT Hardware platforms • Specifications and interfaces • Serial Communication Protocols • Arduino IDE • Arduino Programming • Interfacing various sensors, modules and devices to Arduino 	6	20	<ul style="list-style-type: none"> • Working with Arduino IDE • Program Arduino board • Connect and program various peripherals with Arduino Uno

4	Networking Fundamentals	<ul style="list-style-type: none"> • TCP/IP Basics • IPV6 • Network devices & configurations • Web servers & Socket programming 	4	4	<ul style="list-style-type: none"> • Understand the Networking basics required to set up IoT application. • Understand various IoT communication protocols
5	Wireless for IoT	<ul style="list-style-type: none"> • Overview of Wireless Sensor Networks • IEEE standards for IoT • Overview of Wireless Modems (RF, GSM/GPRS, Bluetooth, RFID, Wi-Fi etc.) • NodeMCU and ESP32 	6	20	<ul style="list-style-type: none"> • Understand the technologies involved in IoT • Interface various wireless modules to embedded systems applications. • Build a wireless sensor network for IoT Application

6	IoT Protocols	<ul style="list-style-type: none"> •IoT Protocol overview •MQTT •COAP •HTTP/HTTPS •6lowpan 	3	3	<ul style="list-style-type: none"> • Understand various IoT communication protocols • Implementation of MQTT and COAP protocols
7	IoT Graphical user interface and back end Application Design	<ul style="list-style-type: none"> •Web development for IoT •Introduction to HTML and PHP •IoT application development for Mobile 	2	6	<ul style="list-style-type: none"> • Understand the IoT application development tools. • Understand how to Implement IoT Applications

8	Cloud platforms for IoT	<ul style="list-style-type: none"> • IoT dashboards • Introduction to various cloud platforms • Device and data management from Cloud Platforms • Uploading data from hardware platforms to cloud 	3	5	<ul style="list-style-type: none"> • Data collection and representation on various cloud based Dashboard • Data analysis and decision making for various application
Total			90 Hours(Theory-30, Lab-60)		