IOT ARCHITECTURES AND PROTOCOLS SYLLABUS

Module 1: IoT Fundamentals

- Definition and Characteristics of Internet of Things (IoT)
- Challenges and Issues
- Physical Design of IoT
- Logical Design of IoT
- IoT Functional Blocks

Module 2: IoT Communication Architectures and Protocols

- Control Units
- Communication Modules
- Bluetooth
- Zigbee
- WiFi
- GPS
- IoT Protocols
    - IPv6
    - 6LoWPAN
    - RPL
    - CoAP
- MQTT
- Wired Communication
- Power Sources

Module 3: Technologies Behind IoT

- Four Pillars of IoT Paradigm
    - RFID
    - Wireless Sensor Networks

    - Supervisory Control and Data Acquisition (SCADA)
    - M2M
- IoT Enabling Technologies
    - Big Data Analytics
    - Cloud Computing
    - Embedded Systems

Module 4: Programming the Microcontroller for IoT

- Working Principles of Sensors
- IoT Deployment for Raspberry Pi / Arduino / Equivalent Platform
- Reading from Sensors
- Communication: Connecting Microcontroller with Mobile Devices
    - Communication through Bluetooth
    - WiFi and USB
- Contiki OS
- Cooja Simulator

Module 5: Resource Management in IoT

- Scalability
    - Network Configuration Protocol
    - Open vSwitch Database Management Protocol
- Routing and Protocols
    - Collection Tree
    - LOADng

Module 6: IoT to Web of Things

- Scope of Web of Things (WoT)
- IoT Data Management
    - Set Up Cloud Environment
    - Cloud Access from Sensors
    - Data Analytics Platforms for IoT

- Resource Identification
    - Richardson Maturity Model
    - REST API

Module 7: Applications of IoT

- Business Models for IoT
- Green Energy Buildings and Infrastructure
- Smart Farming
- Smart Retailing
- Smart Fleet Management